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# Tree Farm Licence 6

**Issued to Western Forest Products Limited**

## Rationale for Allowable Annual Cut (AAC) Determination

**Effective September 1, 2001**

**Ken Baker**
**Deputy Chief Forester**

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## Objective of this Document

This document is intended to provide an accounting of the factors I have considered and the rationale I have employed in making my determination, under Section 8 of the *Forest Act*, of the allowable annual cut (AAC) for Tree Farm Licence (TFL) 6. This document also identifies where I believe new or better information is needed for incorporation in future determinations.

## Description of the TFL

TFL 6, also known as the Quatsino TFL, is held by Western Forest Products Limited ('the licensee'). The TFL consists of a 198 113-hectare total land base located in the northern portion of Vancouver Island. The TFL is administered by the Port McNeill Forest District, which is part of the Vancouver Forest Region.

A forest management license covering the TFL area was originally issued in 1950. In 1998, a portion of TFL 25 (block 4 near Port McNeill) was added to TFL 6. The Kingcome Timber Supply Area (TSA) borders portions of the TFL, while the 21 849-hectare Cape Scott Provincial park borders the northwest portion of the TFL.

The principal communities (and approximate populations) near or within the TFL are Port Hardy (5280), Port McNeill (3110) and Port Alice (1290). Also present within the TFL are the smaller communities of Holberg, Winter Harbour and Coal Harbour. The economies of the communities on northern Vancouver Island are highly dependent on resource-based industries including forestry, tourism, fishing and mining.

The forest sector is the leading employer in the Port McNeill Forest District area, and in 1996 directly and indirectly supported approximately 39 percent of total employment. Most of the wood harvested on the TFL is transported to processing facilities on Vancouver Island and the Lower Mainland of British Columbia.

The Quatsino, Kwakiutl and Tlatiasikwala First Nations asserted traditional territories cover much of the TFL 6 land base.

Most of the forests in TFL 6 are within the Coastal Western Hemlock biogeoclimatic zone. Hemlock-leading forests are most common in the TFL; also present are western redcedar, balsam (true firs), Sitka spruce, Douglas-fir and alder.

The forests in the TFL support a diversity of wildlife including black-tailed deer, Roosevelt elk, black bear, wolf, cougar, eagles and marbled murrelet.

## History of the AAC

The AAC for the TFL was periodically determined between 1950 and 1970. After completion of a new forest inventory in 1970, the AAC for the TFL was established at 1 367 711 cubic metres in 1971. There have been several AAC determinations since 1971, with the AAC generally being set at about 1 300 000 cubic metres. The AAC for the original TFL 6 area was last determined in 1995 to be 1 288 000 cubic metres. In 1998, the AAC was amended to 1 490 000 cubic metres when block 4 was deleted from TFL 25 and added to TFL 6.

Of this AAC, the licensee has been entitled to 1 464 264 cubic metres and the Small Business Forest Enterprise Program has been entitled to 13 242 cubic metres. The remaining 12 494 cubic metres has been associated with the Mahatta River area which was deleted from TFL 6 as part of an exchange of timber harvesting rights between the licensee and the BCFS. The Chief Forester's letter to the licensee dated December 4, 1998 indicated that the total AAC for the TFL has not been adjusted to reflect this area deletion.

## New AAC determination

Effective September 1, 2001 the new AAC for TFL 6 will be 1 460 000 cubic metres, which represents a 2 percent decrease from the current AAC.

This AAC will remain in effect until a new AAC is determined, which must take place within five years of this determination.

## Information sources used in the AAC determination

Information considered in determining the AAC for TFL 6 include the following:

- *Statement of Management Objectives, Options and Procedures (SMOOP) for Quatsino TFL 6 Management Plan No. 9 (MP 9),* submitted by Western Forest Products Limited (WFP) on August 10, 1999 and accepted by British Columbia Forest Service (BCFS) on August 30, 1999;
- *Timber Supply Analysis Information Package in preparation of MP 9 for TFL 6,* submitted by WFP on December 14, 1999 and accepted by BCFS on June 13, 2000;
- Existing unmanaged stand yield tables for TFL 6 submitted by WFP on December 14, 1999 and approved by BCFS Resources Inventory Branch on March 24, 2000;
- Managed (regenerated) stand yield tables and site index curves for TFL 6, submitted by WFP on December 14, 1999 and approved by BCFS Research Branch on April 19, 2000;
- *Timber Supply Analysis in preparation of MP 9 for TFL 6,* submitted by WFP on September 13, 2000 and accepted by BCFS Timber Supply Branch;
- *TFL 6 (Quatsino Sound – North Vancouver Island) Draft MP 9 (Sustainable Forest Management Plan)* submitted by WFP on October 23, 2000;
- *TFL 6 (Quatsino Sound – North Vancouver Island) Proposed MP 9 (Sustainable Forest Management Plan)* submitted by WFP on May 17, 2001;
- Summary of public input solicited by the licensee regarding the *Draft MP 9*;
- *TFL 6, Twenty-Year Plan,* initially submitted by WFP on September 22, 2000, subsequently revised and accepted by Port McNeill Forest District, June 8, 2001;
- *TFL 6 Annual Reports,* WFP for 1999 and 1998;
- *Landscape Unit Planning Guide,* Province of British Columbia, March 1999;
- *Higher Level Plans: Policy and Procedures,* BCFS and Ministry of Environment, Lands and Parks (MELP), December 1996;

- Technical review and evaluation of current operating conditions on TFL 6 through comprehensive discussions with BCFS staff, notably at the AAC determination meeting held in Victoria on May 30, 2001;
- Technical information provided through correspondence and communication among staff from BCFS and MELP;
- *Vancouver Island Land Use Plan*. 1994. Province of British Columbia;
- *Vancouver Island Summary Land Use Plan,* released February 16, 2000 which updated and consolidates governments 1994 Vancouver Island Land Use Plan decision and subsequent government reports and decisions on protected areas, special management zones, forest land reserve and the coastal zone;
- *Vancouver Island Higher Level Plan Order* promulgated by the Ministers of Forests; Environment, Lands and Parks; and Energy and Mines which establishes resource management zones and objectives effective December 1, 2000;
- Letter from the Minister of Forests to the Chief Forester, dated July 28, 1994, stating the Crown's economic and social objectives (Appendix 3);
- Memorandum from the Minister of Forests to the Chief Forester, dated February 26, 1996, stating the Crown's economic and social objectives with regard to visual resources (Appendix 4);
- *Forest Practices Code of British Columbia Act*, consolidated to March 2001;
- *Forest Practices Code of British Columbia Act Regulations and Amendments*, current as of March 2001;
- *Forest Practices Code of British Columbia Guidebooks*, BCFS and MELP.

## Role and limitations of the technical information used

Section 8 of the *Forest Act* requires the chief forester to consider biophysical as well as social and economic information in AAC determinations. A timber supply analysis, and the inventory and growth and yield data used as inputs to the analysis, typically form the major body of technical information used in AAC determinations. Timber supply analyses and associated inventory information are concerned primarily with biophysical factors—such as the rate of timber growth and definition of the land base considered available for timber harvesting—and with management practices.

However, the analytical techniques used to assess timber supply are necessarily simplifications of the real world. There is uncertainty about many of the factors used as inputs to timber supply analysis due in part to variations in physical, biological and social conditions, although ongoing science-based improvements in the understanding of ecological dynamics will help reduce some of this uncertainty.

Furthermore, technical analytical methods such as computer models cannot incorporate all of the social, cultural and economic factors that are relevant when making forest management decisions. Therefore, technical information and analysis do not necessarily provide complete answers or solutions to forest management problems such as AAC determinations. The information does, however, provide valuable insight into potential

impacts of different resource-use assumptions and actions, and thus forms an important component of the information required to be considered in AAC determinations.

In determining the AAC for TFL 6, I have considered known limitations of the technical information provided, and I am satisfied that the information provides a suitable basis for my determination.

## Statutory framework

Section 8 of the *Forest Act* requires the chief forester to consider particular factors in determining AACs for TSAs and TFLs. Section 8 is reproduced in full as Appendix 1.

In accordance with Section 23(3) of the *Interpretation Act*, the deputy chief forester is expressly authorized to carry out the functions of the chief forester which include those required under Section 8 of the *Forest Act*.

The chief forester has expressed the importance of consistency of judgment in making AAC determinations. I also recognize the need for consistency of approach. I have observed the chief forester during a number of previous AAC determinations and am familiar with the guiding principles that the chief forester has employed in making AAC determinations. I find these principles to be reasonable and appropriate and I have employed them as described below in making my AAC determination for TFL 6.

## Guiding principles for AAC determinations

Rapid changes in social values and in our understanding and management of complex forest ecosystems mean that there is always some uncertainty in the information used in AAC determinations. When a large number of determinations are made for many forest management units over extended periods of time, administrative fairness requires a reasonable degree of consistency of approach in incorporating these changes and uncertainty. To make his approach in these matters explicit, the chief forester has compiled a set of guiding principles for AAC determinations. I have reviewed these principles and find them to be reasonable, and thus I have adopted and applied them as deputy chief forester in AAC determinations for TFLs. These principles are set out below. If in some specific circumstance it may be necessary to deviate from these principles, I will provide a detailed reasoning in the considerations that follow.

Two important ways of dealing with uncertainty are:

(i) minimizing risk, in respect of which in making AAC determinations, I consider the uncertainty associated with the information before me, and attempt to assess the various potential current and future social, economic and environmental risks associated with a range of possible AACs; and

(ii) redetermining AACs frequently, to ensure they incorporate current information and knowledge, a principle that has been recognized in the legislated requirement to redetermine AACs every five years. The adoption of this principle is central to many of the guiding principles that follow.

In considering the various factors that Section 8 of the *Forest Act* requires the chief forester to take into account in determining AACs, I attempt to reflect as closely as

possible operability and forest management factors that are a reasonable extrapolation of current practices. It is not appropriate to base my decision on unsupported speculation with respect either to factors that could work to increase the timber supply—such as optimistic assumptions about harvesting in unconventional areas, or using unconventional technology, that are not substantiated by demonstrated performance—or to factors that could work to reduce the timber supply, such as integrated resource management objectives beyond those articulated in current planning guidelines or the *Forest Practices Code of British Columbia Act* and its associated regulations (the Forest Practices Code).

The *Forest Practices Code of British Columbia Regulations* were approved by the Lieutenant Governor in Council on April 12, 1995, and released to the public at that time. The *Forest Practices Code of British Columbia Act* was brought into force on June 15, 1995.

Although implementation of the Forest Practices Code has been underway since the end of the transition period on June 15, 1997, the timber supply implications of some of its provisions, such as those for landscape-level biodiversity, still remain uncertain, particularly when considered in combination with other factors. In each AAC determination the chief forester takes this uncertainty into account to the extent possible in the context of the best available information. In making my determination for TFL 6, as deputy chief forester, I have followed the same approach.

As British Columbia progresses toward completion of strategic land use plans, the eventual timber supply impacts associated with the land-use decisions resulting from the various planning processes—including the Commission on Resources and Environment (CORE) process for regional plans, the Protected Areas Strategy (PAS) and the Land and Resource Management Planning (LRMP) process—are often discussed in relation to current AAC determinations. Since the outcomes of these planning processes are subject to significant uncertainty before formal approval by government, it has been and continues to be the position of the chief forester that in determining AACs it would be inappropriate to attempt to speculate on the timber supply impacts that will eventually result from land-use decisions that have not yet been taken by government. I consider this approach to be reasonable and appropriate. Like the chief forester, therefore, I will not take into account the possible impacts of existing or anticipated recommendations made by such planning processes, nor attempt to anticipate any action the government could take in response to such recommendations.

Moreover, even where government has made a formal land-use decision, it may not always be possible to fully analyze and account for the consequent timber supply impact in a current AAC determination. In many cases, government's land-use decision must be followed by a number of detailed implementation decisions. For example, a land-use decision may require the establishment of resource management zones and resource management objectives and strategies for these zones. Until such implementation decisions are made it would be impossible to fully assess the overall impacts of the land-use decision. Nevertheless, the legislated requirement for five–year AAC reviews will ensure that future determinations address ongoing plan implementation decisions.

However, where specific protected areas have been designated by legislation or by order in council, these areas are no longer considered to contribute to the timber supply in AAC determinations.

For the area of TFL 6, many aspects of land and resource use and management have been clarified through government's approval of the Vancouver Island Land Use Plan in 1994, release of the Vancouver Island Summary Land Use Plan in February 2000 (which updates the 1994 plan with subsequent implementation decisions), and release of the Vancouver Island higher level plan order effective December 2000. I address this issue later in this document.

Forest Renewal British Columbia funds a number of intensive silviculture activities that have the potential to affect timber supply, particularly in the long term. As with all components of an AAC determination, like the chief forester, I require sound evidence before accounting for the effects of intensive silviculture on possible harvest levels. Nonetheless, I will consider information on the types and extent of planned and implemented practices as well as relevant scientific, empirical and analytical evidence on the likely magnitude and timing of any timber supply effects of intensive silviculture.

Some have suggested that, given the large uncertainties present with respect to much of the data in AAC determinations, any adjustments in AAC should wait until better data are available. I agree that some data are not complete but this will always be true where information is constantly evolving and management issues are changing. Moreover, in the past, waiting for improved data created the extensive delays that resulted in the urgency to redetermine many outdated AACs in the province between 1992 and 1996. In any case, the data and models available today are improved from those available in the past, and will undoubtedly provide for more reliable determinations.

Others have suggested that, in view of data uncertainties, the chief forester should immediately reduce some AACs in the interest of caution. However, any AAC determination made by the chief forester or myself must be the result of applying our individual judgment to the available information, taking any uncertainties into account. Given the large impacts that AAC determinations can have on communities, no responsible AAC determination can be made solely on the basis of a response to uncertainty. Nevertheless, in making my determination, I may need to make allowances for risks that arise because of uncertainty.

With respect to First Nations' issues, I am aware of the Crown's legal obligations resulting from court decisions in recent years, including those in the Supreme Court of Canada. The AAC that I determine should not in any way be construed as limiting those obligations under these decisions, and in this respect it should be noted that my determination does not prescribe a particular plan of harvesting activity within TFL 6.

With respect to future treaty decisions, as with other land-use decisions it would be inappropriate for me to attempt to speculate on the impacts on timber supply that will result from decisions that have not yet been taken by government.

Overall, in making this AAC determination, as the deputy chief forester, I am mindful of the chief forester's obligation as steward of the forest land of British Columbia, of the mandate of the Ministry of Forests as set out in Section 4 of the *Ministry of Forests Act*,

and of the chief forester's responsibilities under the *Forest Practices Code of British Columbia Act.*

## The role of the base case

In considering the factors required under Section 8 of the *Forest Act* to be addressed in AAC determinations, I am assisted by timber supply forecasts provided to me through the work of the Timber Supply Review program.

For each AAC determination for a TFL, a timber supply analysis is carried out by the licensee using an information package including data and information from three categories—land base inventory, timber growth and yield, and management practices. Using this set of data and a computer model, a series of timber supply forecasts is produced, reflecting different starting harvest levels, rates of change over time, and potential trade-offs between short- and long-term harvest levels.

From this range of forecasts, one is chosen which attempts to avoid excessive changes from decade to decade and significant timber shortages in the future, while ensuring the long-term productivity of forest lands. This is known as the 'base case' forecast, and forms the basis for comparison when assessing the effects of uncertainty on timber supply.

Because it represents only one in a number of theoretical forecasts, and because it incorporates information about which there may be some uncertainty, the base case forecast for a TFL is not an AAC recommendation. Rather, it is one possible forecast of timber supply, whose validity—as with all the other forecasts provided—depends on the validity of the data and assumptions incorporated into the computer simulation used to generate it. In some cases, an AAC is determined that coincides with the base case starting harvest level. In other cases, an AAC is determined which differs significantly from the initial level modelled.

Therefore, much of what follows in the considerations outlined below is an examination of the degree to which all the assumptions made in generating the base case forecast are realistic and current, and the degree to which its predictions of timber supply must be adjusted, if necessary, to more properly reflect the current situation.

These adjustments are made on the basis of informed judgment, using current available information about forest management, which may have changed since the original information package was assembled. Forest management data are particularly subject to change during periods of legislative or regulatory change, such as the enactment of the Forest Practices Code, or during the implementation of new policies, procedures, guidelines or plans.

Thus it is important to remember, in reviewing the considerations which lead to the AAC determination, that while the timber supply analysis with which I am provided is integral to those considerations, the AAC determination itself is not a calculation but a synthesis of judgment and analysis in which numerous risks and uncertainties are weighed. Depending upon the outcome of these considerations, the AAC determined may or may not coincide with the base case forecast. Judgments that may be based in part on

uncertain information are essentially qualitative in nature and, as such, are subject to an element of risk. Consequently, once an AAC has been determined, no additional precision or validation may be gained by attempting a computer analysis of the combined considerations to confirm the exact AAC determined.

### Timber supply analysis

The timber supply analysis for TFL 6 was prepared under the direction of licensee staff. COMPLAN, a spatially explicit forest level simulation model owned by Olympic Resource Management, was used to provide the timber supply forecasts. COMPLAN is designed to schedule harvests according to a range of spatial and temporal objectives assigned to stands. The forecasts from the timber supply model were reviewed by BCFS staff knowledgeable about the model. These staff were able to advise me about the function of this model, and any associated implications for harvest projections.

The timber supply analysis assumptions used in the model were approved by the BCFS in June 2000. I accept the use of these modelling assumptions in the estimation of available timber supply on TFL 6, and my considerations of these assumptions are discussed throughout this document. For example, I address the Vancouver Island higher level plan resource management zones and objectives that were established under the Forest Practices Code in December 2000.

The base case prepared by the licensee is called the current management option in draft Management Plan 9 documents. The base case projected an initial harvest level of 1 452 400 cubic metres per year, a level that is 2.5 percent below the current AAC. The initial harvest level drops 3-4 percent for five year periods until 2020, then declines slightly further to a mid-term low in 2040 of 1 186 754 cubic metres. Harvest forecasts then begin to increase to a long-term level of 1 663 000 cubic metres reached in 2140.

It is very significant to note that projected long-term levels are 45 percent greater than forecast in the previous timber supply analyses for TFL 6 and block 4 of TFL 25. This difference is primarily attributable to use of improved site productivity estimates. Other contributing factors include reduced operational adjustment factors, tree-growth improvement gains, reduction in minimum harvestable size criteria, fertilization-induced reduction in regeneration delays, and expansion of the timber harvesting land base from the contribution of areas now considered operable by helicopter harvesting. I discuss these factors later in this document.

The licensee proposed an initial harvest level of 1 469 900 cubic metres which is 1.3 percent below the current AAC but slightly higher than the initial harvest level in the base case. The licensee proposal includes a request for a 14 500 cubic metre partition for economically marginal forests that were excluded from the timber harvesting land base in the base case and a 3000 cubic metre partition for commercial thinning. I will address this proposal under the appropriate factors in this document.

In the timber supply analysis, various sensitivity analyses were conducted to assess the potential implications for timber supply arising from uncertainty in data assumptions and estimates. These analyses have also assisted me in considering the factors leading to my determination.

As discussed and quantified throughout this rationale, and in consideration of the items described above, I am satisfied that the information presented to me provides an adequate basis from which I can assess the timber supply for TFL 6 for this determination.

## Consideration of Factors as Required by Section 8 of the *Forest Act*

**Section 8 (8)**

**In determining an allowable annual cut under subsection (1) the chief forester, despite anything to the contrary in an agreement listed in section 12, must consider**

**(a) the rate of timber production that may be sustained on the area, taking into account**

**i) the composition of the forest and its expected rate of growth on the area,**

Land base contributing to timber harvesting

*- general comments*

The total area of TFL 6, as estimated from the licensee's inventory file, is 198 113 hectares. This area excludes Marble River Park (1 422 hectares), Quatsino Park (634 hectares), Raft Cove Park (423 hectares), and Misty Lake Ecological Reserve (60 hectares) which are found within the general TFL outer boundaries. Also excluded was the larger Cape Scott Provincial Park (21 849 hectares) which consists of former TFL and TSA lands. The licensee's analysis did not include these protected areas in assessments of non-timber values and I discuss this issue later under *landscape-level biodiversity*.

Non-forest and non-productive forest lands were excluded from the total land base to arrive at an estimated 185 491 hectares (about 94 percent of the total area) of productive forest land.

As part of the process used to define the timber harvesting land base (i.e., the land base estimated to be biologically and economically available for harvesting), a series of deductions was made from the productive forest land base. These deductions account for the factors that, for ecological or economic reasons, effectively reduce the suitability or availability of the productive forest area for harvest. For TFL 6, the deductions result in a timber harvesting land base of 149 747 hectares (approximately 81 percent of the productive forest land).

My consideration of the deductions applied in the derivation of the timber harvesting land base is presented in the following sections of this rationale. The factors listed below are discussed in the order in which reductions to the land base were made in the timber supply analysis. Because some specific areas could have been removed for more than one reason, but of course were not, the area reduction for each factor would vary if a different order had been used.

*- non-forested and non-productive lands*

In the timber supply analysis, the licensee deducted a 12 622-hectare area classified in the inventory file as non-forested or non-productive from the timber harvesting land base. Examples include alpine forest, water bodies, swamps and classified roads depicted on the inventory file.

I am generally satisfied that the licensee's inventory files represent the best available information regarding this factor and accept this reduction as reasonable for the purposes of this determination.

*- non-commercial brush*

In the analysis, about 415 hectares of non-commercial brush were excluded from the timber harvesting land base. District staff advise me that these area are not likely to develop into mature forests due to frequent natural disturbances such as slides or flooding. I therefore accept the reduction applied for this factor.

*- low site productivity*

The licensee deducted the area of sites that are not expected to yield economic volumes of timber over reasonable time frames. This was based on the licensee's *site productivity* estimates (discussed later). A total of 11 947 hectares of the lowest productivity sites (Productivity Group 5) were excluded from the timber harvesting land base. District staff advise that they are not aware of harvesting performance on these low sites.

The next highest productivity sites (Productivity Group 4) is defined as having a minimum standing volume at maturity of 439 cubic metres per hectare. The licensee documented harvesting performance on these sites and the analysis includes them in the timber harvesting land base.

I am satisfied that the area excluded from the timber harvesting land base to account for low site productivity is reasonable, and that it reflects operational practice in the TFL.

*- inoperable areas*

Portions of the TFL area that are not physically accessible for harvesting, or that are not expected to be feasible to harvest economically, are categorized as inoperable and are excluded when deriving the timber harvesting land base. A total of 12 579 hectares were excluded as inoperable in the timber supply analysis for TFL 6.

A methodology for classifying operable and inoperable areas was developed and approved by the Port McNeill Forest District in 1998. The classification was then applied to TFL 6 with the work completed in 1999 and approved by the district. Operability classes included "conventionally operable" and "helicopter operable" that were included in the timber harvesting land base. Excluded from the land base as inoperable were "physically inaccessible/inoperable", "marginally economic helicopter" and "marginally economic conventional".

The operability classification was the basis for removing unmerchantable forest types from the timber harvesting land base. These were all mature height class 1 and 2 stands,

pure hemlock-balsam height class 3 stands, stocking class 3 open stands, and all pine dominant stands.

In addition to merchantability, three key operability considerations are (1) terrain stability, (2) helicopter operable, and (3) marginal operability:

*1) terrain stability:*

Terrain stability classes originally mapped for the TFL were revised in 1998 to follow BCFS classification standards. Terrain class 1 is considered most stable while terrain classes 4 and 5 are considered most prone to landslides. About 41 percent of the productive forests in class 5 areas, and 18 percent of class 4 areas, were excluded from the timber harvesting land base. Terrain classes 4 and 5 represent about 7 and 3 percent respectively of the timber harvesting land base in TFL 6.

The licensee assessed past harvesting activity in terrain classes 4 and 5 on slopes both less than, and greater than, 50 percent. Harvesting has occurred on about 42 percent of classes 4 and 5 in total, with about 27 percent of the slopes steeper than 50 percent having been harvested to date. The area in classes 4 and 5 on slopes greater than 50 percent with no harvesting history represents about 3600 hectares or 2.4 percent of the land base.

A sensitivity analysis assessed the impacts of removing class 4 and 5 areas – about 10 percent of the land base. The harvest flow used in the sensitivity analysis enabled short-term levels to be maintained, but resulted in significant reductions in mid- and long-term timber supply. Avoiding major mid-term declines would require reductions in short-term timber supply should the land base decline by 10 percent. This sensitivity analysis considerably overstates any uncertainty in terrain stability assumptions given the much smaller land base (2.4 percent) that has not been harvested on class 4 and 5 areas with slopes greater than 50 percent.

Given that the operability mapping has been validated by the district office, and that a significant amount of harvesting has occurred on terrain classes 4 and 5, I accept the general approach used in defining the base case. I am however also mindful of landslide concerns on northern Vancouver Island from harvesting on unstable terrain and recognize that there may be some uncertainty in this factor. Accordingly, I request under "Implementation" that the licensee track harvesting results on terrain class 4 and 5 areas, separately on slopes less than and greater than 60 percent (given the importance in the Forest Practices Code of the 60 percent slope criterion for terrain stability).

*2) helicopter operable:*

The operability classification identified 3.6 percent of the timber harvesting land base as being "helicopter operable". The previous AAC for TFL 6 included a partitioned AAC for helicopter harvesting of 10 200 cubic metres. Although there has been only limited performance with helicopter harvesting on TFL 6, the licensee has considerable experience with this method in other areas. The licensee has identified a considerable area of helicopter harvesting in its approved twenty-year plan. District staff note that there is considerable and increasing helicopter harvesting occurring elsewhere in the

Port McNeill Forest District, and advise that it is reasonable to expect future harvesting performance on the "helicopter operable" class on TFL 6.

The harvest flow used in the sensitivity analysis for this factor indicates that short-term harvest levels could be maintained even if helicopter operable areas were assumed to be inoperable. There would, however, be a significant reduction over a ten-year period in the mid-term, to just over 1 000 000 cubic metres.

I am satisfied that the inclusion of helicopter operable areas in the land base is reasonable based on the information provided. However, given that these areas may be on the margin of economic viability, I request in "Implementation" that the licensee track its harvesting performance in the helicopter operable areas that have been identified in the current timber supply analysis.

*3) marginal operability:*

The two "marginal" operability classes that were excluded in the base case total 950 hectares. The licensee has proposed a harvest level of 14 500 cubic metres to be added (partitioned) to the base case as an incentive to test performance in these marginal areas.

A sensitivity analysis that assumes these marginal areas are in fact operable increases mid-term timber supply but does not improve short-term levels relative to the base case.

District staff note there has been very little harvesting in these marginal areas to date. I am therefore satisfied that it was appropriate to exclude them from the timber harvesting land base. I speak to the issue of partitioning the AAC under "partitioned component of the harvest".

*- riparian reserves*

The Forest Practices Code requires that riparian reserves (where harvesting is excluded) be established around certain types of streams. The width of the reserve depends on stream class. Streams are classified following a field survey that is usually undertaken prior to intended harvesting activity and this information forms part of the cutting permit.

The licensee assessed the average reserve width for surveyed streams and by extension applied this to unsurveyed streams, on a premise that the areas with operationally surveyed streams are representative of the areas with unsurveyed streams. District and MELP staff have no information to either confirm or refute this assumption, and I therefore accept it as the best available information.

In the analysis, a reserve of 10 metres was also applied around lakes, classified as L1, and wetlands, classified as W1. The total length of these reserves is 176 kilometres and 191 kilometres respectively.

Using this approach, the licensee applied a 6302 hectare (3.5 percent) reduction in the land base to account for riparian reserves. Although I accept the reduction in the land base for this factor as the best available information, I recognize in "Implementation" the need to better document reductions for riparian reserves.

The licensee also addresses riparian management zones and I discuss this later under "Integrated resource management objectives".

*- wildlife habitat reserves*

On-going wildlife habitat inventory initiatives in the TFL include ungulate winter range and eagle nests surveys, habitat modelling for marbled murrelet, and assessments for deer, elk and black bear.

A total area of 1437 hectares of deer winter range has been identified under the Forest Practices Code in TFL 6. Another 826 hectares are being evaluated to determine if they should be established as winter range. The licensee's timber supply analysis assumes the entire 2263 hectares will be reserved from timber harvesting. This represents a net reduction in the land base (after other reductions were applied) of 1677 hectares (about 1 percent).

Some small reserves for cougars, eagles and black bears (for example, denning sites) have been identified in the TFL. The licensee indicates that these incidental reserves can be easily accommodated within other non-timber reserves. Therefore, no additional management reserve or constraint is assumed in the timber supply analysis to reflect these areas.

BCFS district staff indicate that the above assumptions reflect current practices in the TFL. For example, no harvesting occurs or is planned in either the established winter ranges or the non-established areas under review. Since the exclusion of these areas reflects current management, I accept these reductions as appropriate for the purposes of this determination.

The licensee suggests the non-established areas under review could be replaced in the future with wildlife habitat areas that focus on marbled murrelet nesting needs. I discuss this later under *identified wildlife*.

*- recreational areas*

The licensee actively manages a number of recreational areas and trails within the TFL. Most of these areas are accommodated by the licensee in its integrated resource management of the TFL and few reductions to the timber harvesting land base are needed.

For four recreational areas, the licensee did reduce the land base in its analysis to account for operational constraints on harvesting associated with their management. These are the Spruce Bay old growth reserve, and the Marble River, Grant Bay and Topknot Bay recreational areas. Although the recreational areas have not yet been established under the Forest Practices Code, district staff have advised the licensee about their pending designation. The productive forests total 220 hectares in the four areas, with a 180-hectare net reduction in the land base.

I consider the reduction in the land base for recreational areas to be reflective of current management and appropriately accounted for in the timber supply analysis.

*- ecological areas*

As previously mentioned, the 60-hectare Misty Lake Ecological Reserve (see *general comments)* and the 18-hectare Spruce Bay old growth reserve (see *recreational areas)* were excluded from the timber harvesting land base.

Also excluded was the 120-hectare Varney gene pool area even though this area has no formal status at this time. This deduction has insignificant impacts on timber supply given its relatively small size relative to the entire TFL's timber harvesting land base. I therefore accept this deduction for the purposes of this analysis.

*- deciduous stands*

The licensee's timber supply analysis assumed no contribution by the hardwood volumes in alder or mixed alder/conifer stands. Only the softwood volumes contributed to the modelled timber supply. It was assumed in the analysis, however, that softwood volumes would increase in alder or mixed stands over time because of normal species succession; therefore, these stands were not removed from the timber harvesting land base.

There are 2368 hectares of alder-leading mixed forests included in the timber harvesting land base (about 1.6 percent). The licensee provided a sensitivity analysis that entirely excluded both the hardwood and softwood component of these stands from the analysis. Excluding these stands ironically resulted in a small increase in the softwood timber supply (46 000 cubic metres per year for first 100 years). The licensee speculated that this outcome could have arisen because the model was able to harvest other higher volume stands earlier and avoid adjacency constraints.

Two sensitivity analyses addressed the hardwood volume potential in the TFL. Including the hardwood from alder-leading mixed stands increased timber supply by 18 760 cubic metres on average per year over the first 100 years. Adding the hardwood volume from pure alder stands as well as the alder-leading stands increased supply to 19 070 cubic metres on average per year over the first 100 years (i.e., only 310 cubic metres per year more). The harvest flow chosen by the licensee in the sensitivity analysis showed no short-term impact on timber supply, but did show harvest levels could increase overall in the mid-term between years 2018 and 2068.

The licensee believes alder harvests are unlikely to be significant in the TFL over the next five years until second growth harvesting becomes more common and local demand develops. BCSF staff advised me that there are two active alder forest licenses in the Port McNeill Forest District. District staff also noted that the TFL licensee had tried to harvest alder for use at the Port Alice pulp mill about five years ago, but the operation was not considered successful.

I am aware that the demand for alder is increasing in some areas of the province. However, in TFL 6, the bulk of the alder occurs in mixed stands as opposed to pure alder stands and there is concern about residual coniferous damage. Therefore, I accept the exclusion of hardwood volumes in the base case for the purposes of this determination. If alder demand increases and hardwood volumes are harvested, there is the potential to increase timber supply in the TFL in the mid-term. This issue can be revisited in subsequent determinations should hardwood utilization occur in the TFL.

*- roads, trails and landings*

As discussed above under *non-forest and non-productive lands*, 473 hectares of roads that were classified (mapped) in the forest inventory were deducted from the timber harvesting land base. There are also a number of existing smaller unclassified roads that are no longer considered as productive forest.

For these unclassified roads, a 10-metre unproductive width was assumed in the analysis based on consultation with the engineers in the company's logging divisions within the TFL. A total length of 2577 kilometres of existing unclassified roads resulted in the removal of 2524 hectares of area from the current timber harvesting land base. Combining the classified and unclassified road areas, this exclusion represents about 3.4 percent of the land base that has already been harvested, and will not contribute to future timber supply.

A projected road system of 3089 kilometres of new roads (i.e., roads that are yet to be built) was identified as part of the operability classification for TFL 6. These anticipated roads are assumed to also have a 10-metre unproductive width. This results in an additional road area of 2838 hectares representing 4.7 percent of the area that has not been previously harvested. The forests on this additional road area contribute to the current timber harvesting land base (as these forests will be harvested), but the area is deducted in the analysis as contributing to the land base in the long term.

The deductions for roads in the TFL appear to be on the low end relative to other coastal units. This is reasonable because the TFL is known for having relatively gentler terrain and a higher ratio of operable area to total land area. Less road is required to access a given amount of timber harvesting land base than is typically the case elsewhere on the coast. Nevertheless, a comparison of the ratio of existing road area to harvested area, with future road area to unharvested area, suggests more intensive road development may be required in the future than was necessary in the past.

The licensee states that all trails and the majority of landings are rehabilitated and restocked soon after harvesting. Consequently, the analysis has assumed no associated area reductions for trails and landings. District staff note that a relatively small area of the land base is likely unproductive for landings that have not been rehabilitated.

I am satisfied that the licensee has provided a reasonable estimate of allowances for existing and future roads, trails and landings for the purposes of the analysis. The relatively small area of unproductive forest that may be associated with non-rehabilitated landings likely is not a significant factor affecting timber supply.

Existing forest inventory

*- current inventory*

The most recent forest cover inventory for TFL 6 was completed in 1970 based on aerial photographs taken in 1967. Since then, the inventory has been continuously updated to account for forest cover changes due to harvesting, other depletions (e.g., windthrow, fire), reforestation and growth. An audit conducted by the BCFS Resources Inventory

Branch in 1980 found the inventory to be acceptable. For the purposes of the timber supply analysis, the inventory was updated to January 2000.

A new inventory audit was scheduled for 1997 but was not undertaken because the licensee is currently undertaking a more comprehensive Vegetation Resource Inventory (VRI). The new VRI is nearing completion but was unavailable for use for this timber supply analysis. Some completed features of the VRI are considered in the analysis and will be discussed under the appropriate factor below.

I accept the existing forest inventory as the best available information and appropriate for use in this analysis. I also anticipate that the new VRI should improve the assessment of timber supply and other forest values in time for the next AAC determination.

*- age-class composition*

About 40 percent of the productive forest area within TFL 6 consists of trees older than 140 years of age. About 40 percent of the older forests (or about 15 percent of the total productive forest) is excluded from the timber harvesting land base. Most of the productive forest excluded from the land base is greater than 140 years of age, with relatively little occurring in the younger age classes.

About 32 percent of the timber harvesting land base is greater than 140 years of age, and the balance is predominately between 0 and 80 years of age.

*- species profile*

About 68 percent of the timber harvesting land base is comprised of western hemlock-leading stands; the next most common leading species is western redcedar at about 21 percent. A variety of other species are also present but in relatively minor amounts (below 3 percent each) including yellow cedar, Sitka spruce, balsam, Douglas-fir and alder.

The licensee reports, and district staff confirm, that the harvest profile has reasonably reflected the species profile within the timber harvesting land base.

*- volume estimates for existing unmanaged stands*

Volumes of unmanaged stands that are older than 140 years of age were based on average yields using the original forest inventory plots for the TFL. No net volume growth was projected for these older stands. The BCFS Resources Inventory Branch reviewed this approach and found it acceptable for purposes of timber supply analysis.

Stands 41 to 140 years of age were considered unmanaged because they originated before there was active forest management in the TFL. The original information package submitted by the licensee used yield tables for these stands based on the Variable Density Yield Prediction (VDYP) version 6.4. VDYP yield curves are developed by BCFS Resources Inventory Branch based on growth in unmanaged stands. The licensee determined later that the volume of hemlock-leading stands of this age were underestimated relative to some recent ground sampling from the vegetation resource inventory (VRI). About 87 percent of stands aged 41 to 140 are hemlock-leading. The licensee therefore prepared replacement yield tables for hemlock stands based on

improved local information; these tables were approved by the BCFS Resources Inventory Branch and used for the timber supply analysis.

A sensitivity analysis looked at the impact of using the original VDYP volume yields for the hemlock stands aged 41 to 140 years, rather than the replacement tables developed by the licensee. The analysis showed no impact on short-term harvest flows relative to the base case, but did show increased reductions occurring in the mid-term beginning in the year 2048.

The licensee also prepared a sensitivity analysis to demonstrate the impact of increasing or reducing the volume yields on both unmanaged and managed stands by 10 percent. An increase in stand yields of 10 percent had an impact on both short- and mid-term timber supply enabling initial harvest levels after 5 years to be maintained for nearly 100 years. The harvest forecast used by the licensee to show a 10 percent reduction in estimated yields had no immediate impact in the short-term relative to base case, but did cause a significantly greater reduction in the mid-term. An alternative harvest flow that avoids such a major mid-term disruption would likely show some impact on short-term timber supply. Although not shown in the licensee's sensitivity analysis, increasing or decreasing estimated yields would also have a corresponding impact on long-term timber supply.

I have reviewed the information regarding the volume estimates for existing unmanaged stands. I am satisfied that acceptable procedures were followed and that projected yields have been reasonably applied in the analysis. I therefore accept the information as suitable for use in this determination.

Expected rate of growth

*- volume estimates for managed stands*

To estimate managed stand volumes, the licensee used the standard Table Interpolation Program for Stand Yields (TIPSY) developed and maintained by the BCFS Research Branch. All existing stands less than 40 years of age are considered managed in the analysis.

For existing managed stands, free growing stocking densities are assumed in the analysis for stands less than 20 years of age (age class 1) reflecting the stocking standards and typical planting densities used in the TFL. Natural regeneration with higher stocking densities is assumed for stands 20 to 40 years of age (age class 2).

TIPSY (version 2.1) was also used for stands regenerated in the model following future harvest. The analysis applied TIPSY estimates according to site productivity (see below) and intended silvicultural strategies identified in the licensee's draft TFL management plan, such as species to be planted, spacing and other treatments like spacing and fertilization.

TIPSY volume projections are initially based on relatively ideal conditions such as full site occupancy and the absence of the pests. Operational Adjustment Factors (OAFs) are applied to account for losses of timber volume due to stand openings for unproductive areas like small swamps and rock outcrops (OAF1), as well for age-dependent factors such as pests, disease, decay, waste and breakage (OAF2).

For most units in the province, a standard reduction of 15 percent is applied for OAF1 factors. A random sample of 68 plots on regenerated stands in TFL 6 showed that less than 5 percent of the sampled areas were classified as non-productive. These results were supported by a separate study conducted on *site productivity* (see below) where excellent stocking and very little unmapped non-productive area were found in regenerated stands. Based on this evidence, the licensee applied a 10 percent reduction for OAF1 in the analysis. The standard reduction of 5 percent was used for OAF2.

Volume estimates for managed stands, including the use of OAFs, was accepted for use in the timber supply analysis by BCFS Research Branch staff.

I am satisfied that the assumptions for this factor have been reasonably applied in the analysis, and that estimates for future stand yields are acceptable for the purposes of this determination. I am also aware that any uncertainty in this factor affects timber supply in the long-term but not in the short-term.

*- site productivity*

The productivity of a site largely determines how quickly trees grow. This in turn affects the time seedlings will take to reach green-up conditions, the volume of timber that can be produced, and the ages at which a stand will satisfy mature forest cover requirements and reach a merchantable size. Site productivity is often expressed in terms of site index, which is based on a stand's height as a function of its age. Site indexes in TFL 6 are assigned according to the licensee's ecosite classification system completed in 1986.

In the timber supply analysis that supported the previous AAC determination for TFL 6, the chief forester requested that the licensee complete a study examining site index relationships with the ecosite classification. The purpose of this study was to reduce uncertainty in this factor in support future determinations.

The licensee followed-up on this request and completed a study of second growth site index for the original area of TFL 6. This report was completed in 1997 and approved by Research Branch. The results of the study were extrapolated to the recently added portion of TFL 6 (formerly block 4 of TFL 25). Research Branch accepted this approach as part of the information package for the timber supply analysis in 2000.

Productivity groups are recognized in the analysis based on grouping ecological units (ecosites) having similar site productivity potential. The study sampled the four productivity groups with a focus on hemlock-leading forests that dominate the TFL, and involved field sampling 21 to 140 year old hemlock stands to ensure good estimates of site index. Estimates for the average site index for cedar, balsam and spruce stands were derived from equations relating the average site index of hemlock to the averages of these other species. An equation developed by the BCFS was used to estimate the average site index for Douglas-fir.

Site productivity groups using the ecosite classification were also applied to forecast volume yields of existing unmanaged stands. While this is not normal practice, it was required because the original forest inventory for TFL 6 did not have height information for stands less than 140 years of age. The use of site indices for unmanaged stands was reviewed and accepted by both Research and Resources Inventory Branches.

Sensitivity analyses were provided to indicate the potential impact of changing assumptions in this factor. Increasing site productivity estimates by 10 percent enabled a significant increase in timber supply in the short-, mid- and long-term. Short-term harvest levels could increase to about 1 600 000 cubic metres per year and generally be maintained for over 100 years. The harvest flow chosen in the sensitivity analysis that examined a 10 percent reduction in site productivity indicated that mid-term timber supply would be dramatically reduced relative to the base case (i.e., to as low as 500 000 cubic metres lower than the base case in year 2048). If an alternative flow were used to reduce mid-term impacts, some short-term impacts would be evident. These analyses suggest that this unit is very sensitive to changing assumptions regarding site productivity; this factor not only affects expected volume yields but also ages needed to reach green-up and meet forest cover adjacency constraints.

I have reviewed the information regarding site productivity on TFL 6. I appreciate the study undertaken and completed by the licensee as requested in the previous AAC determination to reduce uncertainty in this factor. I understand that the site productivity estimation methods were reviewed and approved by appropriate expert BCFS staff and I have no reason to believe that site productivity has been either over- or under-estimated for TFL 6. In conclusion, I am satisfied that the site productivity estimates used to determine the growth of stands on TFL 6 represent the best available information for use in this determination.

- *minimum harvestable ages*

A minimum harvestable age is an estimate of the earliest age at which a stand has reached a harvestable condition (i.e., has met minimum merchantability criteria). The minimum harvestable age assumption largely affects when second growth stands will be available for harvest. In practice, many forest stands may be harvested at older ages than the minimum harvestable age. This is due to economic considerations and constraints on harvesting which arise from managing for other forest values such as visual quality, wildlife habitat and water quality.

In the timber supply analysis for TFL 6, the minimum harvestable age was the age closest to the time when average stand diameter at breast height (dbh) reached a threshold size. This was selected by the licensee based on values and cost structures associated with current harvesting and manufacturing systems. This was assumed to be the age required to reach 42 centimetre dbh for the most productive sites (Productivity Group 1), 37 centimetres dbh for medium sites (Group 2 and 3), and 30 centimetres dbh for lower sites (Group 4). The resultant minimum age derived from applying the criteria varied greatly based on factors such as species and site productivity, but on average it was about 100 years of age. These minimums were modestly reduced from the 45, 40 and 35 centimetres used respectively in the previous timber supply analysis.

The licensee notes that minimum harvest sizes are conservative relative to other coastal timber supply units and could be reduced further to maximize volume production. The licensee, however, feels this would have an undesirable impact on harvesting costs, log values and some non-forest values associated with older forests. Similarly, adopting a maximum physical wood production criterion (maximum mean annual increment or

MAI) was considered unsuitable by the licensee because of undesirable small piece sizes obtained at the lower indicated harvestable stand ages.

The several sensitivity analyses undertaken for this factor indicate that timber supply in the TFL is relatively sensitive to changing assumptions in minimum harvestable ages. For example, one sensitivity analysis examined the impact of increasing minimum harvest sizes to those assumed in the previous timber supply analysis. Although one harvest flow notes no short-term impact, it does cause significant additional mid-term reduction in timber supply. If another harvest flow were chosen to avoid a large mid-term decline, some declines in short-term timber supply relative to the base case would be required.

If minimum harvest ages were reduced by 10 years relative to the base case, short-term harvest levels could be maintained for 50 years (2008 to 2058) before a delayed and short (one decade) mid-term decline.

Another sensitivity analysis assessed the impact of using 95 percent of MAI. In this case, short-term harvest levels in year 2008 could be increased by over 5 percent (to about 1 500 000 cubic metres) relative to the base case. This increase could be maintained for 40 years before declining for a relatively short time period (one decade).

District staff reviewed the criteria used by the licensee, and indicate that the derived ages seem reasonable.

Because the TFL is sensitive to changing assumptions regarding minimum harvestable ages, I request in "Implementation" that the licensee review the criteria for this factor to reduce uncertainty for future analyses. For example, the licensee should examine the impact of applying the same minimum harvestable diameter criterion regardless of site productivity.

For this determination, I accept the minimum harvestable ages assumed in the analysis, and make no adjustments.

**(ii) the expected time that it will take the forest to become re-established on the area following denudation,**

Regeneration delay

Regeneration delay is the period between harvesting and the time at which an area becomes occupied by a specified minimum number of acceptable, well-spaced seedlings. In timber supply analysis, regeneration delay is used to determine the starting point of tree growth for the yield curves that project stand volumes over time.

The forest inventory for the TFL identifies areas with potential severe regeneration problems as part of the environmental sensitivity area (ESA) mapping. All such areas in fact occur in productivity class 5 areas which were excluded from the timber harvesting land base (see *low site productivity* above).

For TFL 6, the licensee assumed that regeneration delay on the timber harvesting land base would vary depending on ecosite and intended treatment (e.g., planting versus natural regeneration, fertilization). For most sites, this translated into expected regeneration delays of from 0 to 2 years. Some high elevation sites are assumed to be

regenerated in 4 years since additional in-planting is expected to be needed following initial planting.

The main impediment to prompt regeneration is brush competition from salal on some cedar/hemlock sites within the TFL. This is addressed by the licensee though treatments such as use of select planting stock and fertilization.

Dividing the current not-satisfactorily-restocked area (2588 hectares) in 1999 by the area harvested in 1999 (1536 hectares) suggests an average regeneration delay of about 1.7 years. This is very similar to what is assumed in the timber supply analysis for regeneration delay.

District staff note that the licensee has an aggressive reforestation program where most areas are regenerated within two years with one-year old planting stock. Since 1987, the licensee has planted an average of about 1700 hectares per year.

I have reviewed the information regarding regeneration delays. Based on the discussions with district staff, I accept that the analysis assumptions reflect the best available information and that they are suitable for use in this determination.

Not-satisfactorily-restocked areas

Not-satisfactorily-restocked (NSR) areas are those areas where timber has been removed, either by harvesting or by natural causes, and a stand of suitable tree species and stocking has yet to be established. Where a suitable stand has not been regenerated and the site was harvested prior to 1987, the classification is 'backlog' NSR. All other harvest-related NSR is considered 'current' NSR.

As discussed above under "regeneration delay", the current NSR in the timber harvesting land base is 2588 hectares. All areas are intended to be restocked through the licensee's reforestation program. The timber supply analysis treated this area as fully stocked following the specified regeneration delay period for that particular site.

The forest inventory for the TFL noted 165 hectares of backlog (i.e., following harvesting) and natural origin (i.e., following natural disturbances) NSR. The licensee and BCFS district staff have confirmed that this small area is now regenerated and the inventory should be reclassified to reflect this. The timber supply analysis therefore assumed this area is now fully stocked.

I am satisfied that the treatment of NSR in TFL 6 has been appropriately reflected in the analysis.

**(iii) silviculture treatments to be applied to the area,**

Silvicultural treatments

*- silvicultural practices*

Most harvesting on TFL 6 has involved the use of clearcut-with-reserve or retention harvest methods. Most of the reserves have been designed to be external to the cutblock area because the strong winds that characterize this part of Vancouver Island can make internal reserves very susceptible to blowdown.

Silvicultural treatments following harvesting are based on the licensee's ecological classification (ecosite) system. For example, for some ecosites, full planting is intended, while on other sites, partial planting will be augmented by natural regeneration. Some ecosites are also scheduled for fertilization and spacing.

The timber supply analysis reflects the current and expected silvicultural practices for the various ecosites as identified in the licensee's draft Management Plan 9. District staff confirm that the analysis assumptions regarding silvicultural practices are reasonably consistent with current management on TFL 6.

I have considered the information regarding silvicultural practices and I accept the information as appropriate for this determination.

*- tree-growth improvement*

For their planting programs, the licensee uses select seeds from native trees that demonstrate good growth and other characteristics at its orchards. The planted stock therefore includes natural genetic traits that prompt increased growth and yield relative to natural regeneration. The licensee is committed to further improving the growth characteristics of its planting stock.

The licensee's timber supply analysis assumed that use of improved planting stock would increase projected yields relative to normal TIPSY curves (see *volume estimates for managed stands).* The analysis used a 5 percent gain for hemlock, yellow cedar and Douglas-fir planted areas over the next 10 years, and 15 percent gain for such stands planted after that. This reflects anticipated continued improvement in the growth potential of planting stock. A 3 percent gain was applied for areas planted with western redcedar and Sitka spruce. These assumptions were based on the licensee's experience (e.g., from their hemlock tree improvement program) and were validated by BCFS Research Branch staff.

A sensitivity analysis tested the impact on timber supply of excluding the tree-growth improvement gains assumed in the timber supply analysis. The harvest forecast showed no impact on short- or mid-term harvest levels, but did show a significant shortfall in harvest levels in the long-term after 180 years.

I have reviewed the information regarding tree improvement assumptions in the timber supply analysis and I am satisfied that it reasonably reflects reforestation practices in the TFL. I am aware that any uncertainty in this factor does not have a bearing on either

short- or mid-term timber supply. I therefore accept the treatment of this factor as applied in the timber supply analysis.

*- incremental silviculture*

Incremental silviculture includes activities such as commercial thinning, juvenile spacing, pruning and fertilization that are beyond the silviculture activities required to establish a free-growing forest stand. A number of these activities have occurred, and are planned, for the TFL.

Using the ecosite classification in the TFL, incremental silvicultural treatments are prescribed for a number of stands and have been assumed in the timber supply analysis. Fertilization is currently undertaken, and intended, at time of planting for all salal sites in order to reduce regeneration delays due to brush competition. This activity has been accounted for in the analysis under "regeneration delay" (see above).

Post-planting fertilization is also undertaken, and prescribed, for some sites. About 5925 hectares of cedar stands have been treated and site productivity increases were modelled in the analysis to reflect anticipated gains (e.g., from productivity group 2 to 3 until time of harvest). BCFS Research Branch staff have accepted this approach, but with the caveat that they are uncertain if the gains will be realized at time of harvest. The timber supply analysis accounts for these previously treated areas and 146 hectare per year of intended new treatment. Although the licensee's draft management plan identifies an average of 1000 hectares of fertilization per year as a target (subject to funding), this was not assumed for the purposes of the timber supply analysis.

About 300 hectares per year of spacing on certain hemlock stands was assumed in the timber supply analysis based on intended treatments in the draft TFL management plan. Over the last five years, the licensee has treated an average of 460 hectares per year in this regard.

The licensee has conducted an average of 475 hectares per year of pruning over the last five years. This is identified as a continued goal in the TFL draft management plan. Pruning results in product quality improvements rather than volume improvements, and was therefore not modelled in the timber supply analysis.

A sensitivity analysis assuming no post-planting fertilization suggests any timber supply impacts would be limited to the long-term (beyond 220 years). Similarly, a sensitivity analysis that assumed no spacing did not show timber supply impacts in the short- or mid-term.

The assumption of fertilization and spacing in the timber supply analysis reflects past performance and is reasonable to expect in the future. I am aware that any uncertainty in this factor does not introduce risk to short-term timber supply, and I accept the assumptions made for this factor for the purposes of this determination.

*- commercial thinning*

The licensee believes it may be possible to mitigate the anticipated decline in harvest levels in the mid-term, as projected in the timber supply analysis, with commercial thinning. The licensee also recognizes that more information is needed before any large scale projects are undertaken since there is limited experience with commercial thinning in the TFL. District staff have observed poor results from previous experiments in hemlock stands largely because of damage to residual stands following thinning operations. However, some success has been achieved with other species.

As an incentive to undertake experimental thinning projects, the licensee proposes a 3000 cubic metre annual partitioned increase in the initial harvest levels identified in the base case.

The timber supply analysis does not assume any commercial thinning. Sensitivity analysis was undertaken to show the impact of the licensee's proposed partitioned harvest beginning in year 2000. The sensitivity analysis showed a slightly increased short-term harvest resulting from commercial thinning would reduce harvest flows in the mid-term relative to the base case. This is because the volumes taken from stands through thinning would not be available at later time of final harvest, thus lowering yields available in the mid-term.

This suggests that it may be more prudent to delay even modest commercial thinning operations to when they may be most needed in the mid-term. I recognize the importance of commercial thinning as potentially bridging a mid-term gap in timber supply during a transition from old growth to second growth harvesting. But for this TFL, the timber supply analysis suggests this transition would begin in around 30 years. Although I encourage small experimental commercial thinning operations, I do not feel a separate commercial thinning partition is warranted in the TFL at this time. The new AAC for the TFL should provide sufficient flexibility to enable experimental thinning operations to proceed.

**(iv) the standard of timber utilization and the allowance for decay, waste and breakage expected to be applied with respect to timber harvesting on the area,**

Utilization standards

Utilization standards define the species, dimensions and quality of trees and logs that must be harvested and removed from an area during harvesting operations. The timber supply analysis modelled standard BCFS coastal utilization standards for existing unmanaged and managed stands.

For existing unmanaged stands, utilization standards include a minimum 17.5-centimetre diameter at breast height (dbh) with a 30-centimetre maximum stump height and 10-centimetre minimum top diameter inside bark (dib).

For managed stands, utilization standards include a minimum 12.5-centimetre dbh with a 30-centimetre maximum stump height and 15-centimetre minimum top dib. Although regional standards for second growth specify a 10-centimetre top dib, the yield difference between this and the 15-centimetre minimum modelled in the timber supply is known to be negligible.

The application of utilization standards in the timber supply analysis was approved by Resources Inventory and Research Branch staff. District staff confirm that current utilization practices in the TFL reflect these standards. I am therefore satisfied that the timber supply analysis appropriately accounted for this factor.

Decay, waste and breakage

For regenerated stand yields, as previously discussed (see *volume estimates for managed stands*), the TIPSY model incorporates OAFs that account for anticipated decay, waste and breakage.

For existing unmanaged stand yields, estimates of volume of wood lost to decay, waste and breakage reflect the VDYP 6.4 model developed by the BCFS Resources Inventory Branch. Decay losses are built into initial volume estimates, while standard waste and breakage losses for coastal forests were applied in the timber supply analysis and these are reflected in the VDYP model.

The licensee used standard procedures to account for decay, waste and breakage losses in the analysis for TFL 6 and the approach was accepted by Resources Inventory and Research Branch staff.

Upon review of the information, I am satisfied that acceptable procedures were used to account for this factor.

**(v) the constraints on the amount of timber produced from the area that reasonably can be expected by use of the area for purposes other than timber production,**

Integrated resource management objectives

The Ministry of Forests is required under the *Ministry of Forests Act* to manage, protect and conserve the forest and range resources of the Crown and to plan the use of these resources so that the production of timber and forage, the harvesting of timber, the grazing of livestock and the realization of fisheries, wildlife, water, outdoor recreation and other natural resource values are coordinated and integrated. Accordingly, the extent to which integrated resource management (IRM) objectives for various forest resources and values affect timber supply must be considered in AAC determinations.

Management for non-timber resources involves two basic strategies: (1) no harvest in certain areas, and (2) harvesting methods designed to address non-timber values. Under "*land base contributing to timber harvesting*", I have noted productive forests that were excluded from the timber harvesting land base to protect various non-timber values.

This section of the rationale addresses how the licensee has accommodated non-timber values, such as biodiversity and visual resources, where harvesting is intended. Non-timber values can be addressed, for example, by varying the size and shape of cutblocks and green-up heights required for regeneration on harvested areas before adjacent areas may be harvested. Green-up requirements provide for a distribution of harvested areas and retention of forest cover in a variety of age classes across the landscape.

The licensee's draft management plan for TFL 6 identifies how it intends to address non-timber values with forest development activities. This was modelled in the timber supply analysis and is described in the following sections.

*- cutblock adjacency and green-up*

The spatially explicit COMPLAN model utilized by the licensee for the timber supply analysis accounts for adjacency considerations throughout the timber harvesting land base. A harvest block size was limited to 40 hectares throughout the TFL. Green-up height was specified as 3 metres for most of the TFL and higher in *scenic areas* (see below). A number of sensitivity analyses were provided regarding adjacency and green-up in the TFL.

One sensitivity analysis addressed the timber supply impact of increasing maximum cutblock size to 120 hectares. This showed that mid-term harvest levels could be increased by about 30 000 cubic metres per year for 30 years relative to the base case.

Another sensitivity analysis addressed changes in green-up heights. Reducing green-up by 2 metres (from 3 to 1 metres) in areas that are not visually sensitive allowed only a small increase in mid-term harvest levels of about 6000 cubic metres per year. Increasing green-up heights by 2 metres (from 3 to 5 metres) resulted in a significant decline in the harvest level of about 154 000 cubic metres per year in the period from 2041 to 2050.

District staff confirm that the assumptions applied in the timber supply analysis do reflect previous practices.

After the timber supply analysis was completed, however, the Vancouver Island higher level plan was established in December 2000. The higher level plan provides new direction on cutblock sizes and green-up for the TFL. For example, for special management zones, maximum cutblock sizes are now reduced to 5 hectares, and for enhanced management zones green-up requirements have been reduced to 1.3 metres height. I address this issue separately under *Vancouver Island Land Use Plan* (below).

*- landscape-level biodiversity*

Biodiversity is defined as the full range of living organisms, in all their forms and levels of organization, and includes the diversity of genes, species and ecosystems and the evolutionary and functional processes that link them. Under the Forest Practices Code, biodiversity in a given management unit is assessed and managed at both the landscape and stand levels.

Achieving landscape-level biodiversity objectives involves maintaining forests with a variety of patch sizes, seral stages, and forest stand attributes and structures, across a variety of ecosystems and landscapes. A major consideration in managing for biodiversity at the landscape level is leaving sufficient and reasonably located patches of old-growth forests for species that are dependent on or are strongly associated with old-growth forests. A variety of forest practices is often needed to emulate natural disturbance patterns under which ecosystems have evolved.

To address landscape-level biodiversity under the Forest Practices Code, landscape units are established by the district manager. These units are delineated based on topographic

or geographic features such as a watershed, or series of watersheds, to manage for biodiversity and other forest resource values.

The *Biodiversity Guidebook*, the *Landscape Unit Planning Guide* and *Higher Level Plans: Policy and Procedures* all provide policy and guidance on management for landscape-level biodiversity. The *Landscape Unit Planning Guide* (LUPG) provides guidance on which components of the full range of recommendations included in the *Biodiversity Guidebook* should be implemented to achieve a balance of forest management objectives. The LUPG contains forest cover requirements for old seral forest that are to be applied at the biogeoclimatic variant level within each landscape unit. The requirements are stated as a minimum percentage of the productive forest to be retained in stands above a specified age that varies by ecosystem type. The LUPG also allows the old-seral requirement to be phased in over three rotations in landscape units subject to a low biodiversity emphasis options (BEOs).

Government policy direction indicates that one of three biodiversity emphasis options (BEOs)—lower, intermediate or higher—may be employed when establishing biodiversity objectives for a landscape unit. To achieve a balance between biodiversity and timber supply objectives, a mix of BEOs in each subregional planning area is recommended. The proportions of a subregion subject to lower and intermediate biodiversity emphasis should range from 30 to 56 percent, with the average at approximately 45 percent of the area subject to lower, 45 percent to intermediate, and 10 percent to a higher BEO.

Draft landscape unit boundaries and BEOs have been delineated for TFL 6. The old seral forest objectives will be met through the establishment of old growth management areas (OGMAs) within landscape units. The licensee is working with the BCFS and MELP in the identification of OGMAs and this process is expected to be completed later in 2001.

For most of the province at this time, including TFL 6, landscape units and objectives are draft and have not yet been formally established under the Forest Practices Code. The BCFS Timber Supply Branch developed an approach to account for landscape-level biodiversity in timber supply analysis when landscape units and BEOs are not yet formally established. This approach applies an average old seral forest cover requirement weighted to reflect the 45-45-10 mix of BEOs in each draft landscape unit. The licensee applied this approach in its timber supply analysis for TFL 6.

As discussed under "land base contributing to timber harvesting", protected areas located both within and adjacent to the TFL boundary were excluded from the timber supply analysis in assessments of non-timber values. Government policy is to include old seral forest contributions in protected areas in achieving landscape-level biodiversity objectives. The licensee believes that the biogeoclimatic variants to which these areas would contribute towards old seral objectives are not constraining short-term timber supply. The addition of these areas, however, could cause timber supply to rise in the long-term.

A sensitivity analysis was undertaken using the draft BEOs (rather than the weighted average approach) which included the phase-in of old seral objectives in low BEO landscape units. The sensitivity analysis showed no impact on short-term harvest levels, but did indicate a one-decade mid-term (2041-2050) additional deficit of 71 000 cubic

metres per year relative to the base case. Once again, this sensitivity did not include old seral forests in protected areas within landscape units so it likely overstated impacts on timber supply.

A public comment requested that the early seral objectives in the *Biodiversity Guidebook* be applied to the TFL. A sensitivity analysis examined the impact of applying early seral objectives and found that the impact would be very severe in this TFL with initial harvest levels being virtually nil for the first 20 years. Government policy direction has been clear to not apply early seral objectives if timber supply impacts are severe, so I believe the absence of early seral targets in the analysis was appropriate.

Although there is some uncertainty in old seral objectives until such time that landscape units and objectives are formally established, the sensitivity analysis suggests no undue risk to short-term harvest levels. I therefore accept the assumptions made in the analysis as reasonable for the purposes of this determination.

In my "Reasons for Decision", I recognize a potential for a small increase in long-term timber supply relative to the base case because the analysis did not include old seral forests in protected areas as contributing to landscape-level biodiversity objectives.

*- stand-level biodiversity*

Stand-level biodiversity management includes retaining wildlife tree patches (WTPs), within or adjacent to cutblocks to provide structural diversity and wildlife habitat. The *Biodiversity Guidebook* makes recommendations for percentages of area to be retained in WTPs based on specific assumptions about the land base.

Using the guidebook, the licensee indicates that current management practice in the TFL is for at least 13 percent WTP retention associated with cutblocks. The WTPs are mainly located in reserves adjacent (external) to the actual cutblock area in areas already deducted from the timber harvesting land base (such as riparian reserves, inoperable areas and low sites).

For the purposes of the timber supply analysis, it was assumed that 75 percent of WTP requirements could be met in areas already deducted from the timber harvesting land base. The figure is based on the general findings in the *Forest Practices Code Timber Supply Analysis* report. This results in a net volume reduction of 3.25 percent for WTPs. The timber supply analysis used 4 percent to also account for *riparian habitat* (see below).

Because the TFL is highly operable relative to most other coastal units, BCFS district staff believe that this may underestimate the requirements for WTPs. District staff however have no studies to document this concern and acknowledge no better information is available.

While I believe there is some uncertainty about yield reductions for stand-level biodiversity, I do not feel this introduces undue risk to short-term timber supply. As noted earlier under *volume estimates for existing unmanaged stands*, even a 10 percent decrease in estimated yield does not necessarily result in a short-term impact on timber supply.

I accept the accounting for stand-level biodiversity as reasonable for the purposes of this determination. However, I request in "Implementation" that the licensee track how

WTPs are handled so that this information can be used to reduce uncertainty in this factor for the next AAC determination.

*- riparian habitats*

Riparian habitats occur along streams and around lakes and wetlands. The Forest Practices Code requires the establishment of riparian reserves that exclude timber harvesting, and riparian management zones that may restrict timber harvesting in order to protect riparian and aquatic habitats. Stream classes are described in the *Riparian Management Area Guidebook* and are determined based on presence of fish, occurrence in a community watershed and average channel width criteria. The stream class is used to estimate the area required to be retained in riparian reserves and the area or volume which may be retained in the riparian management zone. Similar criteria are used to classify lakes and wetlands and estimate reserve zone and management zone retention.

About 6302 hectares of riparian reserve were deducted from the timber harvesting land base in the timber supply analysis. The accounting for riparian reserves has already been described above under "*land base contributing to timber harvesting*".

An important objective of riparian management zones is to buffer riparian reserves. The licensee believes that wind pruning operations in reserves zones have permitted it to retain less volume in the management zone while still protecting the reserves. District staff confirm that the licensee does not leave very much volume in riparian management zones.

One public submission suggests riparian management on TFL 6 is in contravention of the *Fisheries Act* despite being in compliance with the Forest Practices Code. The licensee's response noted that it has conducted field audits of TFL 6 in response to concerns raised by Department Fisheries and Oceans, and that the results showed that practices around small fish-bearing streams were very good.

Although there is some uncertainty in the deductions applied for riparian habitat, this should not pose undue risk to short-term timber supply for the purposes of this determination. As discussed earlier, sensitivity analysis indicates even a 10 percent reduction in assumed volume yields relative to the base case could be accommodated in the short-term with impacts delayed to the mid-term.

Having reviewed the information on riparian habitat, I accept that the best available information was used, and that current practice was appropriately reflected in the timber supply analysis. I request under "Implementation" that the licensee track practices in riparian management zones so that this can be better accounted for before the next AAC determination.

*- scenic areas*

The district manager in the Port McNeill Forest District has established scenic areas under the Forest Practices Code. This formally makes known to the licensees areas with important visual resource values that should be addressed in their management. Even though visual quality objectives (VQOs) have not been formally established in the TFL, the licensee accounted for scenic area values by using the visual quality classes (VQCs) within the visual resource (landscape) inventory.

VQCs and percent of the timber harvesting land base are respectively: retention (1 percent), partial retention (5 percent), modification (8 percent) and maximum modification (2 percent).

The maximum disturbance limit for each VQC was assumed in the timber supply analysis as the licensee is committed to incorporating visual landscape design (such as irregular boundaries) within cutblock layout. Maximum disturbance limits are 5 percent for retention, 15 percent for partial retention, and 25 percent for modification VQCs. Maximum modification VQCs are addressed through standard adjacency green-up provisions.

Visually effective green-up heights for scenic areas were specified as 5.7 metres for most of the TFL (i.e., the original TFL 6 area) and 4.1 metres for the newly added area (block 4 from TFL 25). Visual resource values are particularly important feature of the special management zone (identified in the Vancouver Island Land Use Plan) on the west coast of the TFL (i.e., in the original TFL 6 area). Therefore, higher visually effective green-up heights were assumed here.

District staff confirm that landscape design is being applied in the TFL and feel that the assumptions for maximum disturbance and green-up were appropriately accounted for in the timber supply analysis. The higher level plan associated with the *Vancouver Island Land Use Plan* (see below), which was prepared after the timber supply analysis was undertaken, specifies that VQCs are to be used until VQOs are formally established. This tends to reaffirm the assumptions made by the licensee in the base case.

The licensee undertook a sensitivity analysis to assess the impact of reducing the maximum disturbance for each VQC to the middle of specified disturbance range for each class. The harvest flow chosen illustrated a one-decade (2041 to 2050) additional negative impact of 116 500 cubic metres per year in the mid-term relative to the base case. While this is significant, there does not appear to be an impact on short-term timber supply.

Having reviewed the information regarding scenic areas, I am satisfied that the analysis assumptions were acceptable for this determination, and make no adjustments in this regard.

*- recreation features and karst*

The area of TFL 6 is used for a variety of recreational pursuits, including fishing, hunting, hiking and beachcombing. The licensee manages a number of recreation sites and trails in the TFL.

As discussed earlier under *recreational areas,* 180 hectares of productive forests were deducted from the timber harvesting land base where the licensee felt it was necessary to protect values located in four areas.

Several other recreation sites and trails exist on the TFL that are actively managed by the licensee. The licensee feels that timber harvesting activities can be carefully designed to be compatible with recreation management for these other areas, and that no additional cover or green-up constraints are required, other than those noted above under *scenic areas.*

Karst refers to an area largely shaped by the dissolving action of water on carbonate bedrock (usually limestone, dolomite or marble). Karst areas can have unusual features such as sinkholes, disappearing streams and caves which can have recreational, ecological and/or archaeological significance. To help identify these values, a karst inventory was completed in the TFL in 1979. The licensee believes very few incremental timber reserves are needed for karst management based on current experience. Also, most of the areas known to have karst features have already been harvested. The timber supply analysis therefore does not include additional measures for karst management.

District staff confirm that the timber supply analysis reflects current management regarding recreation features and karst.

I have reviewed the information regarding recreation features and karst on TFL 6, and make no adjustments on this account.

- *identified wildlife*

'Identified wildlife' refers to species at risk and to regionally significant species which may be impacted by forest management activities, and which may not be adequately protected by existing management strategies such as those for biodiversity, riparian management, ungulate winter range or through the application of other forest cover constraints.

Under the Forest Practices Code, the identified wildlife management strategy (IWMS) enables wildlife habitat areas (WHAs) to be established. Management measures to protect identified wildlife are described for WHAs. The licensee did not account for identified wildlife in the timber supply analysis since no WHAs have been established on the TFL to date.

The IWMS feature of the Code, however, has relatively recently been initiated and WHAs are likely to be established on the TFL area in the future. The licensee suggests that some or all of the four areas under review in terms of ungulate winter range status (see *wildlife habitat reserves*) could be replaced with WHAs that focus on marbled murrelet nesting needs.

Government policy direction related to Code implementation is to limit the impact of IWMS to one percent of the short-term harvest level of the province. Some identified wildlife species such as marbled murrelet are to be addressed through the location of old growth management areas as part of landscape unit planning if possible, or if required through other mechanisms such as higher level plans.

For this determination, it is not possible to specify the exact location or precise amount of habitat area that will be required within the timber harvesting land base to implement the

IWMS. The Province has made a commitment to implementation of the IWMS and policy decisions include a projected one-percent impact on timber supply province-wide. It is appropriate in this determination to account for an expected but not fully quantified impact on the timber supply. Therefore, in my "Reasons for Decision", I recognize a probable one percent downward pressure on long-term timber supply to account for future measures needed to protect identified wildlife.

Because the AAC will be re-determined every five years as required by legislation, management decisions regarding identified wildlife will be better reflected in future timber supply analyses.

*- watershed considerations*

There is one designated, but unused, community watershed in TFL 6 and one non-designated watershed where water is drawn for community use. The 69-hectare Calbick Creek watershed is located adjacent to the Quatsino First Nations reserve at Coal Harbour and was designated as a community watershed under the Forest Practices Code. Now, however, water is provided to the community from Quatse Lake, and the Calbick Creek watershed is no longer being used as a source of community drinking water. Although the 1728-hectare watershed associated with Quatse Lake is not currently a designated community watershed, the licensee's management plan treats that area as if it were designated.

In its timber supply analysis, the licensee modelled both areas as community watersheds using Code standards, such as for hydrological green-up.

Coastal watershed assessments have been conducted in the TFL to address other watershed considerations such as for fish. None of the assessments have indicated that any rate of cut limitations are necessary for this TFL. BCFS district staff indicate the reason for this is likely because the licensee committed to accessing much of the TFL in the 1970's so that harvesting could be dispersed and not overly concentrated.

I have reviewed the information regarding watershed considerations, and accept that the analysis assumptions were acceptable for use in this determination.

*- cultural heritage resources*

A cultural heritage resource is defined under the *Forest Act* as "an object, a site or the location of a traditional societal practice that is of historical, cultural or archaeological significance to British Columbia, a community or an aboriginal community". Archaeological sites contain physical evidence of past human activity, whereas traditional use sites may not necessarily contain historical physical evidence but may indicate current use by a First Nation. To help manage for unrecorded archaeological sites, an archaeological overview assessment for the Port McNeill Forest District, including TFL 6, was completed in 1995.

The Quatsino First Nation completed a Traditional Use Study for their asserted traditional territory in 1998. The completed Galgalis Traditional Use Study includes the asserted traditional territories of the Kwakiutl and Tlatlasikwala First Nations.

District staff observe that archaeological sites protected under the *Heritage Conservation Act* in the TFL area are generally shell middens and shoreline campsites that are believed to be situated outside the timber harvesting land base. Very few culturally modified trees have been encountered in the TFL. Where they have been encountered, permits have been issued to harvest some of these areas within existing provincial guidelines.

The timber supply analysis did not model an additional constraint for cultural heritage resources. The licensee states that these resources can be protected, and have been protected, within other reserves (such as riparian reserves and wildlife tree patches) established for the TFL area.

BCFS district staff confirm that cultural heritage resource considerations have had only a negligible impact on access to timber in TFL 6.

I have reviewed the information regarding cultural heritage resources, and I am satisfied that the analysis has appropriately reflected the current management for these resources.

**(vi) any other information that, in the chief forester's opinion, relates to the capability of the area to produce timber,**

Other information

*- Vancouver Island Land Use Plan*

The Vancouver Island Land Use Plan was approved by the provincial government in 1994. Since then, a number of implementation actions have been taken including further clarifications of the plan's intent. The Vancouver Island Summary Land Use Plan in 2000 brought together additional direction for resource management zones and other features of the plan. The Forest Practices Code enables certain features of strategic land use plans to be established as a higher level plan. The three ministers with statutory decision-making authority formally established higher level plan resource management zones (RMZs) and objectives for Vancouver Island in December 2000. Operational plans, such as forest development plans, are legally required to be consistent with higher level plans.

The key features of the higher level plan that affect timber supply relate to green-up, cutblock size, visual resources and landscape unit planning.

About eighty percent of the timber harvesting land base in TFL 6 lies within enhanced forestry zones (RMZs 4, 5, 6 and 8). Ten percent is in a general forestry zone (RMZ 7) and ten percent is in special management zones (SMZ 2 and 4).

For the enhanced forestry zone, the higher level plan objective is to increase short-term timber availability by enabling cutblocks to be larger than 40 hectares and by allowing green-up heights to be reduced to a minimum of 1.3 metres.

For the general forestry zone in the TFL, the higher level plan objective enables old growth retention targets in landscape unit planning to be reduced in the short-term if needed to avoid severe socio-economic impacts.

For the special management zones, the higher level plan objective is to sustain ecosystem structure and function by having cutblock sizes be no more than 5 hectares for clearcut and clearcut-with-reserve systems. If other systems such as selection or retention

harvesting are used, a 40-hectare limit can apply. Also, through landscape unit planning, mature forest targets must be set between 25 and 33 percent of the total forested area for each SMZ.

In addition, for SMZ 2, visual quality classes are to guide forest management until visual quality objectives are established. As discussed under *scenic areas*, the assumptions used in the timber supply analysis are consistent with this direction.

The higher level plan decision occurred after the timber supply analysis was completed for TFL 6. Therefore, the analysis does not model most of the features that can affect timber supply. The licensee, however, has provided a number of sensitivity analyses which help to assess the impact of the higher level plan.

Not surprisingly, most of the TFL – originally issued to encourage timber production – is located in the enhanced forestry zone. As discussed above under *cutblock adjacency and green-up*, sensitivity analyses were conducted on cutblock size and green-up. One analysis showed that increasing cutblock openings from 40 to 120 hectares in the TFL increases mid-term harvest levels relative to the base case but does not increase harvest levels in the short-term. Another sensitivity analysis that reduced assumed green-up heights (from 3 metres to 1 metre) indicated a small increase in harvest levels in the mid-term with no impact in the short-term.

Although no sensitivity analysis was undertaken, the opportunity to delay attainment of old growth targets in the general forestry zone (RMZ 7) is likely to exert an upward influence on timber supply.

For special management zones, although no sensitivity analysis was undertaken on reducing maximum cutblock size or achieving mature forest targets, these requirements are expected to exert a downward influence on timber supply relative to the base case.

Overall, I conclude that implementation of the Vancouver Island higher level plan could increase timber supply in the mid-term relative to the base case. This is because the area of enhanced forestry zone in the TFL with reduced green-up and cutblock constraints is much larger than the area of special management zone where constraints are greater than modelled in the timber supply analysis. Implementation of the higher level plan for the TFL does not appear to pose risk to short-term timber supply and could ease the transition by increasing available timber supplies in the mid-term relative to the base case.

Any uncertainty in this factor can be addressed in the timber supply analysis that supports the next AAC determination which is required within five years.

*- twenty-year plan*

The licensee recently submitted a revised twenty-year plan in May 2001 that addressed several comments received from BCFS district staff on an earlier September 2000 draft. District staff reviewed this submission and believe it to be operationally attainable, as well as reflective of current practice and operational plans. The district manager approved the plan in June 2001.

I note that the twenty-year plan provides a good assessment of the short-term operational feasibility of the harvest forecasts in the timber supply analysis.

*- harvest sequencing*

In the timber supply analysis, cutblocks identified in the forest development plan were assumed to be harvested over the first five years. After this, remaining old growth forests available for harvest were given first priority. Once old growth forests are unavailable in the model, merchantable second growth stands are selected for harvest based on lowest periodic annual increment (to minimize growth loss).

The timber supply analysis model also balanced the simulated harvest in various operating areas within the TFL to promote the stability of local communities. A sensitivity analysis that did not consider the balancing of the harvest between operating areas showed no change in available timber supply relative to the base case.

Another sensitivity analysis switched the harvesting priority simply to oldest forest first (also without considering the different operating areas) and this showed a small increase overall in timber availability in the mid-term between 2028 and 2058.

I have reviewed the information regarding the harvest sequencing assumptions in the analysis, and am aware of no issues that would impact this determination.

*- First Nations considerations*

The Quatsino, Kwakiutl and Tlatlasikwala First Nations asserted traditional territories cover much of TFL 6. The Kwakiutl First Nation is in discussions with the federal government on the Douglas Treaty. The treaty area includes 3769 hectares of TFL 6 located between Port Hardy and Port McNeill. The licensee has suspended harvesting in the treaty area at the request of the Kwakiutl in 1997 pending their discussions with the federal government. Outside of these discussions, the licensee is hoping to address the Kwakiutl's concerns in the treaty area and resume limited harvesting operations.

The timber supply analysis included the treaty area in the timber harvesting land base in the development of the base case.

As discussed under my 'Guiding Principles', it is inappropriate for me to attempt to speculate on the impacts on timber supply that will result from decisions that have not yet been taken by government. Any decisions on treaty negotiations that are made can be reflected in future timber supply analyses for the TFL.

*- difference between AAC and actual harvest*

As a normal standard, most licencees have some flexibility in their annual rate of cut during a five-year period referred to as the cut control period. The volume harvested must be within 50 percent of the AAC in each year (annual cut control), and also within 10 percent of the AAC for the five-year period (periodic cut control). This provides some level of community stability in employment yet allows licensees to respond to changes in market demand or other factors.

For the last five-year cut control period between 1995 and 1999, the total actual harvest was 303 415 cubic metres (about 4.5 percent) below the total five year AAC. This undercut is compliant with 10 percent variation allowed. Government decided to offer this undercut volume in a *timber sale license* (see below).

I have reviewed the information on actual harvests and am not aware of any issues that would impact this determination.

*- timber sale license*

As just discussed, government intends to issue a timber sale license for the 303 415 cubic metres of volume that was undercut in the TFL during the last cut control period. This license is intended to be non-replaceable, with a 7-year term.

The licensee's analysis accounted for this license in its modelling of timber supply and preparation of a base case. The volumes available for the timber sale license are not shown in the base case, since these volumes are outside of the TFL's AAC, but are simulated to be harvested as part of the analysis. I am therefore satisfied that this potential new license has been satisfactorily accounted for in the timber supply analysis.

*- forest certification*

The licensee achieved ISO 14001 certification in April 2000 for its environmental management system covering forest operations. The licensee is seeking additional certification under the Forest Stewardship Council (FSC). The licensee's draft Management Plan 9 also constitutes its proposed Sustainable Forest Management Plan under FSC.

One public comment raised concerns about whether the licensee's draft plan would qualify under the FSC. FSC-BC has developed draft regional standards for British Columbia for public review but there currently are no approved standards.

Whether a licensee wishes to seek forest certification is a voluntary decision; there is no requirement to do so, and government has no authority on forest certification.

**(b) the short and long-term implications to British Columbia of alternative rates of timber harvesting from the area,**

Alternative harvest flows

The nature of the transition from harvesting old growth forests to harvesting second growth forests is a major consideration in determining AACs in many parts of the province. In the short-term, the presence of large timber volumes in older forests often

permits harvesting above long-term levels without jeopardizing future timber supply. In keeping with the objectives of good forest stewardship, AACs in British Columbia have been and continue to be determined to help ensure that short- and mid-term harvest levels are compatible with a smooth transition toward the usually (but not always) lower long-term harvest level. Thus, timber supply should remain sufficiently stable so that there will be no inordinately adverse impacts on current or future generations. To achieve this, the AAC determined must not be so high as to cause later disruptive shortfalls in supply, nor so low as to cause immediate social and economic impacts that are not required to maintain forest productivity and future harvest stability.

For TFL 6, the timber supply analysis forecasts long-term harvest levels that are higher than initial harvest levels. Therefore, the challenge in this TFL appears to be reducing the impact of the transition in the mid-term from initial harvesting of old growth to eventual harvesting of even higher yield second growth forests. The base case harvest flow shows initial harvest levels of about 1 452 000 cubic metres will need to gradually decrease to 1 186 754 cubic metres in year 2041 before steadily rising to even higher long-term harvest levels of 1 663 000 cubic metres by year 2141.

Several alternative harvest forecasts were provided by the licensee. One alternative explored maintaining the current AAC of 1 490 000 cubic metres for as long as possible. It showed that the AAC could be maintained for nearly three decades before dramatically declining by nearly 50 percent to just over 1 000 000 cubic metres in 2028.

The results of various alternative harvest flows provide me with a useful assessment of the timber supply dynamics over the term of the analysis horizon. In particular, the results indicate to me that it is important to gradually decrease the current AAC in the TFL so as to avoid major disruptions in the mid-term. This conclusion is reflected in my "Reasons for Decision".

Partitioned component of the harvest

Three components of the existing AAC, totalling 67 200 cubic metres, were specified as partitions in the previous determinations for TFL 6 and block 4 of TFL 25.

For the original area of TFL 6, the chief forester included a partition of 10 200 cubic metres for previously inoperable areas (where there may be helicopter harvesting opportunities) and 52 000 cubic metres for low productivity sites.

Since that time, the licensee has improved its operability classification and site productivity estimates for the TFL, and its assessments of harvesting performance on these components of the land base. The uncertainty that existed in the previous timber supply analysis for these factors has therefore been considerably reduced. Consequently, I no longer see the need to continue with these partitioned components of the harvest.

For block 4 in TFL 25 (which is now part of TFL 6), the chief forester included a 5000-cubic metre partition for commercial thinning. For this determination, the licensee has requested a 3000 cubic metre partitioned AAC as an incentive to undertake experimental commercial thinning. Now that this area has been combined with the original TFL 6 to form a larger area, and as discussed in *commercial thinning* above, I

believe there should be sufficient flexibility in the new AAC for the licensee to undertake thinning experiments without a partitioned harvest.

For this AAC determination, the licensee has also requested a new partition of 14 500 cubic metres related to the 950-hectares of marginal forests (see *inoperable areas*) that were excluded from the timber harvesting land base. A sensitivity analysis that added this area did not increase short-term timber supply but did indicate an increase in mid-term harvest levels. It is my view that the new AAC for the TFL provides sufficient flexibility to the licensee to assess operability on these marginal forests without partitioning the harvest. If harvesting performance is demonstrated, the areas could be included in the timber harvesting land base in future analyses.

I have reviewed the information regarding the partitions from the 1995 AAC determination for TFL 6 and 1996 AAC determination for TFL 25 (block 4), and I am satisfied that the partitions are no longer warranted. I also conclude there is no need for a new partition to prevent overharvesting portions of the land base. I have reflected these conclusions in my 'Reasons for Decision'.

**(c) the nature, production capabilities and timber requirements of established and proposed timber processing facilities,**

Timber processing facilities

Several sawmills and pulpmills process timber from TFL 6. In 1999, 100 percent of the needs at the Duke Point Sawmill were from TFL 6, with 67 percent of Ladysmith, 49 percent of Silvertree, 15 percent of Tahsis, 13 percent of Cowichan Bay, and one percent of Nanaimo sawmill's fibre coming from the TFL. The TFL also supported 46 percent of Port Alice Pulp Mill's, and 2 percent of Nanaimo Log Merchandising's, fibre use. In total, about 29 percent of the manufacturing needs of the above timber processing facilities are known to be supported by harvesting on TFL 6 in 1999.

In addition, chips from the sawmills were sent to the Squamish Pulp Mill and the TFL supports some of the Squamish Sawmill fibre needs. A portion of the TFL 6 harvested volume was also either sold or traded to other forest companies or manufacturers.

In my determination, I am mindful of the important contribution of TFL 6 in supplying the needs of processing facilities throughout Vancouver Island and in the lower mainland area.

Community dependence on the forest industry

BCFS staff provided me with information on community dependence and employment related to the forest management activities on TFL 6. The information noted 1246 persons of total direct employment attributable to the TFL. Total direct employment is measured in full-time equivalents or FTEs (e.g., two half-time positions would equal one full time position). About 580 FTEs of direct employment is supported on North Vancouver Island, 206 elsewhere on the island, 227 in the lower mainland, and an additional 233 associated with manufacturing by someone other than the licensee.

The community that is most dependent on forest harvesting and related activities from the TFL is Port Alice which relies on the TFL for about 233 FTEs in direct employment; this represents nearly 50 percent of current employment in the community. Smaller communities of Holberg and Coal Harbour also depend on employment opportunities afforded by TFL 6.

Having reviewed this information, I am aware that several communities benefit from, and some communities are very dependent on, employment opportunities provided by forest management activities from TFL 6. Consideration of the implications for these communities is an important factor in my determination of an AAC for TFL 6.

**(d) the economic and social objectives of the government, as expressed by the minister, for the area, for the general region and for British Columbia,**

Economic and social objectives

*- Minister's letter and memorandum*

The Minister has expressed the economic and social objectives of the Crown for the province in two documents to the chief forester—a letter dated July 28, 1994, (attached as Appendix 3) and a memorandum dated February 26, 1996, (attached as Appendix 4). These economic and social objectives are an important consideration in my determination of an AAC for TFL 6.

This letter and memorandum include objectives for forest stewardship, a stable timber supply, and allowance of time for communities to adjust to harvest-level changes in a managed transition from old-growth to second-growth forests, so as to provide for community stability.

The Minister stated in his letter of July 28, 1994, that "any decreases in allowable cut at this time should be no larger than are necessary to avoid compromising long-run sustainability." He placed particular emphasis on the importance of long-term community stability and the continued availability of good forest jobs. To this end he asked that the chief forester consider the potential impacts on timber supply of commercial thinning and harvesting in previously uneconomical areas. To encourage this the Minister suggested consideration of partitioned AACs.

I have considered the contents of the letter and memorandum in my determination of an AAC for TFL 6. As discussed under "partitioned component of the harvest", I am satisfied that the opportunities for commercial thinning and harvesting marginal areas on TFL 6 can be accommodated within the AAC without a partitioned harvest. In addition, I observe that larger scale thinning operations are likely best undertaken in about 30 years as part of the transition from harvesting old growth to second growth forests.

The Minister's memorandum addressed the effects of visual resource management on timber supply. In it, the Minister asked that pre-Code constraints applied to timber supply in order to meet VQOs be re-examined when determining AACs in order to ensure that they do not unreasonably restrict timber supply. For TFL 6, I am satisfied that visually sensitive resources in *scenic areas* were appropriately modelled in the timber supply analysis in keeping with the Minister's objectives. For example, the analysis used

the maximum disturbance limits rather than mid-point limits for each visual quality class to reduce timber supply impacts.

*- local objectives*

The Minister's letter of July 28, 1994, suggests that the chief forester should consider important social and economic objectives that may be derived from the public input in the timber supply review where these are consistent with government's broader objectives.

The licensee received a limited number of public comments on its draft Management Plan No. 9 including its timber supply analysis information package. The licensee has responded to the comments, and BCFS district staff confirm that the licensee has satisfactorily met its public input obligations.

I have considered public comments and licensee response in this determination. I am satisfied that the issues identified in the public review have been adequately addressed under the appropriate factors of this document and that no additional significant concerns have been raised that would affect this determination.

**(e) abnormal infestations in and devastations of, and major salvage programs planned for, timber on the area.**

Unsalvaged losses

Unsalvaged losses are timber volumes destroyed or damaged by causes such as fire, insects and diseases that are not recovered through salvage operations. Estimates for abnormal unsalvaged losses account for infestations (such as fire and large windthrow events) that are not incorporated into yield estimates used in the analysis. Normal timber volume losses due to insects and diseases, or windthrow (e.g., single tree or small groups of trees) that affect stands (endemic losses) are mostly accounted for in inventory sampling for existing timber yield estimation or though other methods. Normal losses associated with second-growth stands are addressed by application of operational adjustment factors (OAFs) as noted previously in this rationale.

The timber supply analysis for TFL 6 assumes no unsalvaged losses due to fire. This is because the TFL's climate is characterized by cool and wet summers, and there has been effective fire suppression. Consequently, unsalvaged losses due to fire have been negligible in the past.

For TFL 6, the licensee estimates that abnormal unsalvaged losses due to windthrow are about 5750 cubic metres per year, based on advice from its operations staff. Although large-scale events have occurred in the past (e.g., 1904-06), the network of roads would enable the majority of timber from any future large-scale event to be salvaged.

In the previous AAC determination for TFL 6 in 1995, the chief forester requested that non-recoverable (unsalvaged) losses be better estimated. The licensee has secured funding from FRBC and a project is underway with the University of British Columbia to develop a windthrow hazard rating system and to improve occurrence estimates in the TFL.

In December 1997, an unusual snow and windstorm caused noticeable damage to second growth forests near Port McNeill. A survey suggested that up to 15 000 cubic metres of timber was damaged. Most of the losses could not be salvaged because the damage was widely scattered and/or inaccessible. There is no known history of this kind of damage before in the TFL. To account for this kind of abnormal unsalvaged loss, the licensee assumed an event of this kind could occur at 20-year return intervals. Therefore, an associated annual loss of 750 cubic metres per year was assumed in the timber supply analysis.

Given uncertainty with abnormal windthrow and windstorm losses, the licensee rounded the two estimates losses (5750 and 750 cubic metres respectively) slightly upwards to 7000 cubic metres per year in the timber supply analysis. This is equivalent to about 10 hectares per year or about 0.5 percent of the current AAC.

Although not assumed in the analysis, the licensee expects unsalvaged losses to continue to decrease as the existing road network in the TFL expands.

Although the estimates for unsalvaged losses appear low to district staff, after reviewing the work conducted by the licensee, they are generally satisfied that the estimates are reasonable. They do observe, however, that some additional losses associated with landslides should have been examined. Overall, however, staff believe that the estimates provide a reasonable reflection of actual losses experienced on the TFL.

I am aware that the estimated losses are lower than those used in many nearby coastal units. I believe, however, that this is acceptable because the extensive road network and level of management allow for better than average salvage. I am therefore satisfied from review of the information and discussions with district staff that the estimates provide a reasonable accounting for unsalvaged losses, and make no adjustments in this regard.

### Reasons for Decision

I have considered the information discussed throughout this document, and I have reasoned as follows.

For the reasons stated in 'Timber Supply Analysis' and from reviewing the considerations as recorded above, I accept that the licensee's base case forms an appropriate basis from which to assess timber supply for this AAC determination.

In determining this AAC, I have identified factors which, considered separately, indicate that the timber supply may be either greater or less than that projected in the base case. Generally, some of these factors can be quantified and their impacts assessed with some reliability. Others may influence timber supply by adding an element of risk or uncertainty to the decision but cannot be reliably quantified at this time. These latter factors are accounted for in more general terms.

The area of TFL 6 is subject to the recently approved Vancouver Island higher level plan order which took effect after the licensee had completed its timber supply analysis. In the section of this document entitled *Vancouver Island Land Use Plan*, I discuss how the higher level plan is reflected in the analysis and what upward and downward influences it

has on timber supply. I have therefore considered the potential impact of the higher level plan in this decision.

In this rationale, I have identified two situations in which I believe the base case assumptions differ from current or expected operational practices or conditions:

- identified wildlife: I believe there will be about a one percent downward influence on long-term timber supply as a result of implementing the Forest Practices Code Identified Wildlife Management Strategy. This is a very general estimate only based on provincial timber supply impact guidelines.
- landscape-level biodiversity: I have identified a potential small upward influence on long-term timber supply resulting from the exclusion in the analysis of old forests in protected areas, which I feel will indeed contribute to landscape-level biodiversity objectives.

In comparison to most other coastal units, a relatively large proportion of the TFL's productive forests contributes to the timber harvesting land base. The TFL's relatively gentler terrain appears to be the main reason for this, and reflects the fact that when the licence was first created in 1950's it was designed to cover highly productive and operable forest lands.

It is my general observation that the timber supply analysis for the TFL has not pushed the limits on factors that may contribute to timber supply. For example, assumed merchantability criteria result in minimum harvestable ages that average around 100 years — which I observe to be older than some other coastal units.

In the course of my review of timber supply for TFL 6, I observed several factors that tend to reinforce the general appropriateness of harvest levels noted in the timber supply analysis. These include:

- Vancouver Island higher level plan order: the smaller clearcut sizes required for special management zones will likely exert a small downward influence on timber supply. However, this should be offset by the much larger area in the enhanced forestry zone within the TFL where an upward influence is expected due to the potential for lower green-up heights and larger cutblock sizes relative to those assumed in the base case. The higher level plan order therefore appears to provide an opportunity to reduce impacts on timber supply in the mid-term. This can be examined in future AAC determinations as the plan is implemented.
- volume estimates for existing unmanaged stands: I am comfortable with the replacement yield tables that have been used in the analysis given the improved ground sampling information collected in the TFL.
- deciduous: although there has been very little hardwood utilization in the TFL, and none is assumed in the timber supply analysis, the potential exists for harvesting the deciduous component of the inventory. Alder utilization is occurring in other coastal units and may occur in the TFL. Should hardwood use occur, this could lessen the projected mid-term decline in timber supply projected in the analysis.

- site productivity: I observe in the analysis provided me that the TFL is sensitive to changing assumptions about site productivity. If significant, this could affect short-term timber supply. The estimates provided on site productivity were based on further study as requested in the previous AAC determination in 1995, and were thoroughly reviewed and approved by BCFS staff. I am therefore satisfied that the timber supply analysis adequately reflects site productivity and provides a good basis for me to make this determination.
- landscape-level biodiversity: the sensitivity analysis that captures draft landscape unit biodiversity emphasis options shows little change in timber supply relative to the base case. This provides some assurance regarding the treatment of this factor in the analysis.

The harvest flow projected in the base case indicates a mid-term decline in timber supply. I note that several sensitivity analyses tend to reinforce the need for short-term timber supply to gradually step down to mid-term levels. For example, reducing minimum harvestable ages by 10 years relative to the base case still indicates a requirement to step down initial harvest levels to a mid-term level. Therefore, based on existing information, the issue is how quickly to reduce initial harvest levels to promote a relatively smooth transition to the mid-term. I am mindful of the Minister's letter (Appendix 2) to the chief forester regarding the socio-economic objectives of the Crown. In that letter, the Minister requests that decreases in the AAC be no larger than are necessary to avoid compromising long-run sustainability.

## Determination

I have considered and reviewed all the factors as documented above, including the risks and uncertainties of the information provided. It is my determination that a timber harvest level that accommodates objectives for all forest resources during the next five years, that reflects current and expected management practices as well as the socio-economic objectives of the Crown, can be best achieved on TFL 6 by establishing an AAC of 1 460 000 cubic metres, which is two percent below the current AAC.

As discussed under "partitioned component of the harvest", I am satisfied that the three partitions in the current AAC are no longer required. In reviewing all of the information provided, I do not feel any new partitions are needed to prevent overharvesting portions of the land base.

This determination is effective September 1, 2001, and will remain in effect until a new AAC is determined, which must take place within five years of this determination.

If additional significant new information is made available to me, or major changes occur in the management assumptions upon which I have predicated this decision, then I am prepared to revisit this determination sooner than the five years required by legislation.

**Implementation**

I encourage the licensee staff to undertake the tasks noted below before the next AAC is determined for the TFL, as discussed throughout this rationale document. I recognize that the licensee's ability to undertake these projects is dependent on available staff resource time and funding. However, these projects are important to help reduce the level of risk and uncertainty associated with key factors affecting timber supply on TFL 6.

- operability – Harvesting of areas close to the margin of operability should be tracked by the licensee in terms of area (hectares) harvested. This includes reporting on harvesting "helicopter operable" areas, and areas in Terrain Class 4 and 5 on steeper slopes (>60 percent) and gentler slopes.
- riparian reserves – The licensee is requested to bolster the assumption that the nature of unsurveyed streams is the same as surveyed streams.
- minimum harvestable ages – Given the timber supply sensitivity to changing assumptions in criteria that define minimum harvestable ages, existing methods should be carefully examined recognizing, however, that it is difficult to predict future market demand.
- stand-level biodiversity – The analysis assumed a 3.5 percent reduction to timber supply to account for wildlife tree patches (WTPs). Since this estimate is based on a general provincial estimate, a better accounting for this factor for TFL 6 is preferred.
- riparian management zone – The analysis increased the reduction for WTPs by 0.5 percent (to 4 percent) to account for timber left in riparian management zones and to provide for additional gully management. The licensee should track and report on actual management practices in riparian management zones before the next timber supply analysis.

Ken Baker

Ken Baker
Deputy Chief Forester

July 23, 2001

## Appendix 1: Section 8 of the *Forest Act*

Section 8 of the *Forest Act*, Revised Statutes of British Columbia 1996, reads as follows:

### Allowable annual cut

**8.** (1) The chief forester must determine an allowable annual cut at least once every 5 years after the date of the last determination, for

(a) the Crown land in each timber supply area, excluding tree farm licence areas, community forest areas and woodlot licence areas, and

(b) each tree farm licence area.

(2) If the minister

(a) makes an order under section 7 (b) respecting a timber supply area, or

(b) amends or enters into a tree farm licence to accomplish the result set out under section 39 (1) (a) to (d),

the chief forester must make an allowable annual cut determination under subsection (1) for the timber supply area or tree farm licence area

(c) within 5 years after the order under paragraph (a) or the amendment or entering into under paragraph (b), and

(d) after the determination under paragraph (c), at least once every 5 years after the date of the last determination.

(3) If

(a) the allowable annual cut for the tree farm licence area is reduced under section 9 (3), and

(b) the chief forester subsequently determines, under subsection (1) of this section, the allowable annual cut for the tree farm licence area,

the chief forester must determine an allowable annual cut at least once every 5 years from the date the allowable annual cut under subsection (1) of this section is effective under section 9 (6).

(4) If the allowable annual cut for the tree farm licence area is reduced under section 9 (3), the chief forester is not required to make the determination under subsection (1) of this section at the times set out in subsection (1) or (2) (c) or (d), but must make that determination within one year after the chief forester determines that the holder is in compliance with section 9 (2).

(5) In determining an allowable annual cut under subsection (1) the chief forester may specify portions of the allowable annual cut attributable to

(a) different types of timber and terrain in different parts of Crown land within a timber supply area or tree farm licence area, and

(b) different types of timber and terrain in different parts of private land within a tree farm licence area.

(c) [Repealed 1999-10-1.]

(6) The regional manager or district manager must determine an allowable annual cut for each woodlot licence area, according to the licence.

(7) The regional manager or the regional manager's designate must determine a rate of timber harvesting for each community forest agreement area, in accordance with

(a) the community forest agreement, and

(b) any directions of the chief forester.

(8) In determining an allowable annual cut under subsection (1) the chief forester, despite anything to the contrary in an agreement listed in section 12, must consider

(a) the rate of timber production that may be sustained on the area, taking into account

(i) the composition of the forest and its expected rate of growth on the area,

(ii) the expected time that it will take the forest to become re-established on the area following denudation,

(iii) silviculture treatments to be applied to the area,

(iv) the standard of timber utilization and the allowance for decay, waste and breakage expected to be applied with respect to timber harvesting on the area,

(v) the constraints on the amount of timber produced from the area that reasonably can be expected by use of the area for purposes other than timber production, and

(vi) any other information that, in the chief forester's opinion, relates to the capability of the area to produce timber,

(b) the short and long term implications to British Columbia of alternative rates of timber harvesting from the area,

(c) the nature, production capabilities and timber requirements of established and proposed timber processing facilities,

(d) the economic and social objectives of the government, as expressed by the minister, for the area, for the general region and for British Columbia, and

(e) abnormal infestations in and devastations of, and major salvage programs planned for, timber on the area.

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## Appendix 2: Section 4 of the *Ministry of Forests Act*

Section 4 of the *Ministry of Forests Act* (consolidated 1988) reads as follows:

### Purposes and functions of ministry

4. The purposes and functions of the ministry are, under the direction of the minister, to

   (a) encourage maximum productivity of the forest and range resources in British Columbia;

   (b) manage, protect and conserve the forest and range resources of the government, having regard to the immediate and long term economic and social benefits they may confer on British Columbia;

   (c) plan the use of the forest and range resources of the government, so that the production of timber and forage, the harvesting of timber, the grazing of livestock and the realization of fisheries, wildlife, water, outdoor recreation and other natural resource values are coordinated and integrated, in consultation and cooperation with other ministries and agencies of the government and with the private sector;

   (d) encourage a vigorous, efficient and world competitive timber processing industry in British Columbia; and

   (e) assert the financial interest of the government in its forest and range resources in a systematic and equitable manner.

## Documents attached:

## Appendix 3: Minister of Forests' letter of July 28, 1994

## Appendix 4: Minister of Forests' memo of February 26, 1996

File: 10100-01

JUL 28 1994

John Cuthbert
Chief Forester
Ministry of Forests
595 Pandora Avenue
Victoria, British Columbia
V8W 3E7

Dear John Cuthbert:

**Re: Economic and Social Objectives of the Crown**

The *Forest Act* gives you the clear responsibility for determining Allowable Annual Cuts, decisions with far-reaching implications for the province's economy. The *Forest Act* provides that you consider the social and economic objectives of the Crown, as expressed by me, in making these determinations. The purpose of this letter is to provide this information to you.

The social and economic objectives expressed below should be considered in conjunction with environmental considerations as reflected in the Forest Practices Code, which requires recognition and better protection of non-timber values such as biodiversity, wildlife and water quality.

The government's general social and economic objectives for the forest sector are made clear in the goals of the Forest Renewal Program. In relation to the Allowable Annual Cut determinations you must make, I would emphasize the particular importance the government attaches to the continued availability of good forest jobs and to the long-term stability of communities that rely on forests.

Through the Forest Renewal Plan, the government is taking the steps necessary to facilitate the transition to more value-based management in the forest and the forest sector. We feel that adjustment costs should be minimized wherever possible, and to this end, any decreases in allowable cut at this time should be no larger than are necessary to avoid compromising long-run sustainability.

.../2

Province of
British Columbia

Minister of
Forests

Parliament Buildings
Victoria, British Columbia
V8V 1X4

In addition to the provincial perspective, you should also consider important local social and economic objectives that may be derived from the public input on the Timber Supply Review discussion papers where these are consistent with the government's broader objectives.

Finally, I would note that improving economic conditions may make it possible to harvest timber which has typically not been used in the past. For example, use of wood from commercial thinnings and previously uneconomic areas may assist in maintaining harvests without violating forest practices constraints. I urge you to consider all available vehicles, such as partitioned cuts, which could provide the forest industry with the opportunity and incentive to demonstrate their ability to utilize such timber resources.

Yours truly,

Andrew Petter
Minister

Province of British Columbia
OFFICE OF THE MINISTER

Ministry of Forests

# MEMORANDUM

File: 16290-01

February 26, 1996

To: Larry Pedersen
Chief Forester

From: The Honourable Andrew Petter
Minister of Forests

**Re: The Crown's Economic And Social Objectives Regarding Visual Resources**

Further to my letter of July 29, 1994, to your predecessor, wherein I expressed the economic and social objectives of the Crown in accordance with Section 7 of the *Forest Act*, I would like to elaborate upon these objectives as they relate to visual resources.

British Columbia's scenic landscapes are a part of its heritage and a resource base underlying much of its tourism industry. They also provide timber supplies that are of significant economic and social importance to forest industry dependent communities.

Accordingly, one of the Crown's objectives is to ensure an appropriate balance within timber supply areas and tree farm licence areas between protecting visual resources and minimizing the impact of such protection measures on timber supplies.

As you know, I have directed that the policy on management of scenic landscapes should be modified in light of the beneficial effects of the Forest Practices Code. In general, the new policy should ensure that establishment and administration of visual quality objectives is less restrictive on timber harvesting. This change is possible because alternative harvesting approaches as well as overall improvement in forest practices will result in reduced detrimental impacts on visually sensitive areas. Also, I anticipate that the Forest Practices Code will lead to a greater public awareness that forest harvesting is being conducted in a responsible, environmentally sound manner, and therefore to a decreased public reaction to its visible effects on the landscape. In relation to the Allowable Annual Cuts determinations that you make, please consider the effects that the new policy will have in each Timber Supply Area and Tree Farm Licence.

.../2

In keeping with my earlier letter, I would re-emphasize the Crown's objectives to ensure community stability and minimize adjustment costs as the forest sector moves to more value-based management. I believe that the appropriate balance between timber and visual resources will be achieved if decisions are made consistent with the ministry's February 1996 report *The Forest Practices Code: Timber Supply Analysis*.

Finally, in my previous letter I had asked that local economic and social objectives be considered. Please ensure that local views on the balance between timber and visual resources are taken into account within the context of government's broader objectives.

Andrew Petter
Minister of Forests